THE DETERMINANTS OF MICROFINANCE INSTITUTIONS' CAPITAL STRUCTURE AROUND THE WORLD

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Abstract

An enduring problem facing microfinance institutions is access to funding. This study investigates the determinants of MFIs access to funding using a comprehensive measure of capital structure. The design of the study takes account three gaps in our current understanding of this topic. Firstly, despite the huge literature on MFIs corporate governance and the significant role of women on microfinance outcomes, it is perhaps surprising that no research has been conducted on the effect of board gender diversity on MFIs capital structure. Secondly, the role of standard firm-specific and institutional-specific factors in determining MFIs capital structure decision is unclear. Utilizing an alternative regression framework may provide a reliable analysis. Thirdly, our understanding of the composition of MFIs leverage is far from complete. The relationship between deposit liabilities and non-deposit liabilities have not yet been subject of investigation.

In response to these three major issues, this study employs empirical research methods using panel data analysis technique. We find that female directors have significant positive influence on deposits and subsidies. Furthermore, the study also shows evidence of risk-taking attitude among female directors when MFIs have three or more of them on board. Secondly, we find that the effect of firm-specific factors on MFIs capital structure differ across countries, while prior studies assume equal impact of these determinants. We find that institutional-specific factors significantly explain the variation of MFIs leverage across countries. However, commercially related institutional factors does not affect MFIs access to subsidies. We also show that there is an indirect impact of institutional factors, as we report their significance effect through firm-specific factors. Finally, the study provides empirical evidence that deposits and borrowings are substitutes rather than complements, and that the degree of substitutability is more pronounced in MFIs operating in a developed financial sector, where the degree of information asymmetry is lower.

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Chapter 1 – Introduction and problem statement

1.0. Introduction

Microfinance is the provision of broad range financial services to the poor who are traditionally not served by the conventional financial institutions (Ledgerwood, 1999; Hartarska, 2005). A great scale of organizations is considered as microfinance institutions (MFI). They are the vehicle that offer credits and other financial services to low income households. MFIs are considered as an effective tool for reducing poverty through improving access to finance and financial services to poor families and small businesses situated mostly in developing and newly industrialised countries. According to Tchigoua (2014) MFIs complement effectively the formal banking sector in providing financial services to the poor. They play a significant role in bridging the gap between the formal financial institutions and poor household by mobilizing financial resources through provision of savings and loans.

In recent years, financing problems has become an important issue in the microfinance sector, increasingly as a consequence of the financial crisis, subsequent government interventions and the institutional restructuring that followed. During a time of financial crisis, when donor funding is shrinking, the question of capital structure becomes salient. What is the best mix of debt, equity and grant funding that will ensure solvency and self-sufficiency? The question how best to fund microfinance institutions, particularly those with access to subsidized funding, is increasingly important.

Within the academy, the issue of capital structure determinants has been studied intensely since Modigliani and Miller published their seminal 1958 paper, “The Cost of Capital, Corporate Finance and the Theory of Investment.” Significant progress has been made in understanding the determinants of firm capital structure using various corporate finance theories (Gropp and Heider,

2010; Shyam-Sunder and Myers, 1999; Harris and Raviv, 1991; Titman and Wessels, 1988; Myers and Majluf, 1984; Jensen and Meckling, 1976). However, the application of Modigliani-Miller theorem and other capital structure theories and models on MFIs is less straightforward, especially when MFI's capital structure mix comprises non-commercial funding such as donations, grants and subsidies. Basic corporate finance principles are applicable to MFIs only after accounting for fundamental differences on how they operate. MFIs are a particular type of lending institution, offering risk and return, and the nature of regulation is markedly different from standard corporate firms (Bogan, 2012). Therefore, the theoretical notion of an optimal capital structure of MFIs is not very well defined.

This thesis investigates the determinants of microfinance institutions capital structure based on corporate finance theories. It uses a comprehensive measure of capital structure in recognition of MFIs unique funding structure.

1.1. Background of the study

Microfinance today is a major industry that comprise of thousands of institutions serving around 155 million clients worldwide (Armendariz and Morduch, 2010). In its modern form, poverty alleviation practitioners conceived microfinance as a tool to provide sustainable financial services to populations typically excluded from mainstream banking institutions (Dichter, 1999; Yunus, 2007). Aside from the growth of microfinance, funding constraints within the industry have prevented MFIs from meeting the enormous demands of poverty alleviation (Earne and Sherk, 2013). Gosh and Van Tassel (2011) argue that the MFIs with access to cheap external funding have the capacity to offer cheap credits to impoverished clients, and they promote and support development through income generating activities.

Over the years, microfinance institutions have continued to attract an increased funding from a variety of sources. According to Consultative Group to Assist the Poor (2011), between 2007 and 2010, the total global investment in microfinance quadrupled to reach US$24billion. As of December 2009, international funding to microfinance institutions was estimated at US$21billion. More than 56% of these funds are allocated directly to MFIs, 38% transit through microfinance investment vehicles, and 6.1% go through Apex organizations. The composition of microfinance funding remains a topic of discussion. Early microfinance institutions relied predominantly on donor funding and grants (Rhyne, 1998; Morduch, 1999), an increasing number of MFIs are moving towards commercialisation where investors demand financial returns (Armendiz and Morduch, 2010). Therefore, the need to understand MFIs diverse sources of funding remains pertinent.

The increasingly broad range of financing sources available to microfinance institutions creates greater funding diversification. According to Consultative Group to Assist the Poor (2010), there are three main sources of funding for MFIs, namely, deposits (for deposit-taking MFIs), debts (commercial debt, subsidized debts or bonds offering), and equity (Shareholder equity and donated equity). Some of this funding comes primarily with a social mission while others are commercially motivated (Helms, 2006). For example, Cull et al., (2009) illustrated the various classification of MFI funding instruments based on a sample of 289 MFIs. Savings by clients otherwise known as deposits and commercial funding seems to be the main source of funding for shareholder based MFIs, whereas donations and non-commercial borrowing are the main source of funding for MFIs registered as non-governmental organizations (NGO).

The unique feature of that part of MFI funding that is subsidized, grants and subsidies in the sector remains present. Very few MFIs have been created without subsidies, and even commercially

oriented have regularly benefited from support from international donors. Microfinance institutions receive subsidized external funding usually in the form of subsidized debt or equity and sometimes as grants. Subsidized debt also known as concessionary borrowing or soft loans are funding contracted below market price or on a favourable contractual agreement (Tchuigoua, 2014), whereas subsidized equity is part of MFIs equity that has returns below market rate. It is a financial instrument promoted by donors and channelled through micro investment vehicles (Hudon and Traca, 2011). Other forms of subsidized funding available to MFIs are cash, grants and donations. Multilateral banks, government organizations and apex foundations often provide these funds without necessarily demanding positive returns (Tchuigoua, 2014).

Subsidized funds channelled through Microfinance Investment funds have been created with large inputs from International donor. It is estimated that donors commit more than US$2 billion every year to the microfinance sector globally as subsidy and grants (CGAP, 2010). Research show that majority of MFIs still depend on donations and subsidies to break even (Hermes and Linsink, 2011; D'Espallier et al., 2013). The 2010 microfinance institutions benchmark report that only 50% of the 1300 MFI's studied have an average ratio of 1.03 in their operationally self-sufficiency level (MIX, 2012). Meaning to say, the remaining 50% still depend on grants and subsidies. D'Espallier, Hudon and Szafar (2013) show that only about 23% of the World's MFIs survive without subsidies.

Figure 1.1: Total Donated Equity

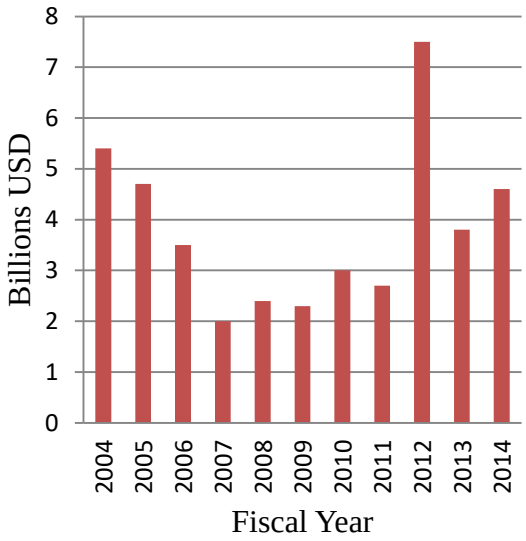
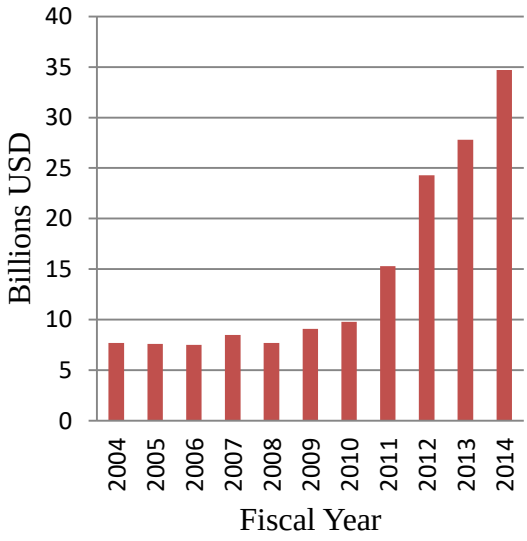


Figure 1.2: Total Equity



Source: Mix Market, 2004-2014. See data in Funding Structure Analysis

Figure 1.1 shows the total amount of donated equity to MFIs from 2004 to 2014. Donated equity was high in the early stages but slightly degreasing to 3 billion USD in 2006. However, by 2007, donated equity shrank and volumes remained constant as donor agencies retreated due to the global financial crisis. Donated equity increased after the recovery in 2012. Figure 1.2 shows a steady increase in equity investment of MFIs from 2004 to 2014.

However, microfinance institutions that rely solely on subsidies are financially constrained and to overcome this challenge, MFIs seek commercial sources of funding to actualise the microfinance project. The promoters of commercialisation advocate MFIs should be less reliant on subsidies and grants (Bogan, 2012). Armendariz and Morduch, (2010) argue that commercialisation may increase MFI's capacity to expand and scale up their leveraging assets. Deposits are a frequently used by MFIs as commercial instruments to fund their projects and to make loans (Cull et al., 2009. They consist of demand deposits (short-term) and time deposits (programmed savings) (CGAP, 2011). Besides some deposit-taking MFIs consider savings as a prerequisite for borrowers to access loans, in other words, it is financial collateral used by borrowers to access MFIs loans

(Armendariz and Morduch, 2010). It reinforces MFIs' contracts by serving as collateral for MFI borrowers.

Figure 1.3: Total Deposits

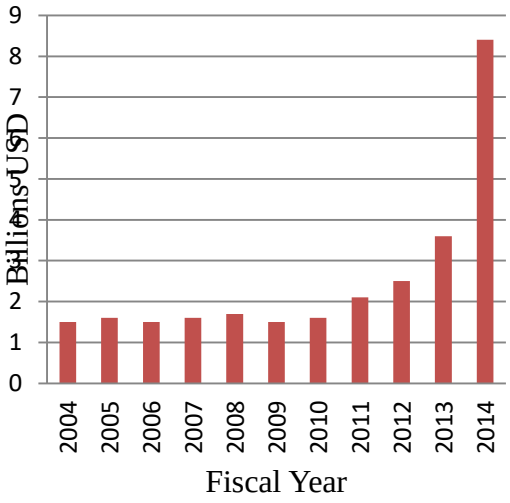
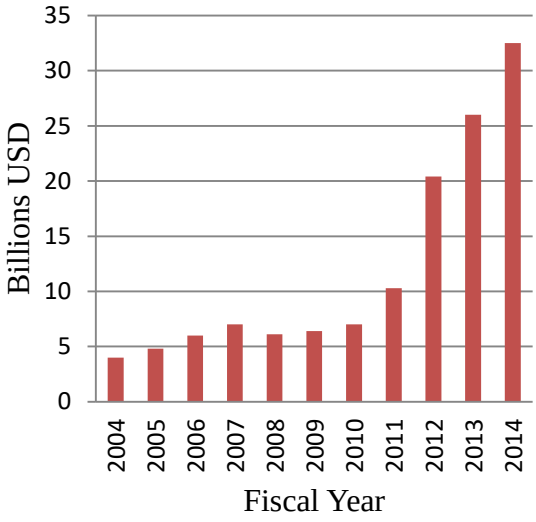


Figure 1.4: Total Borrowings



Source: Mix Market, 2004-2014. See data in Funding Structure Analysis

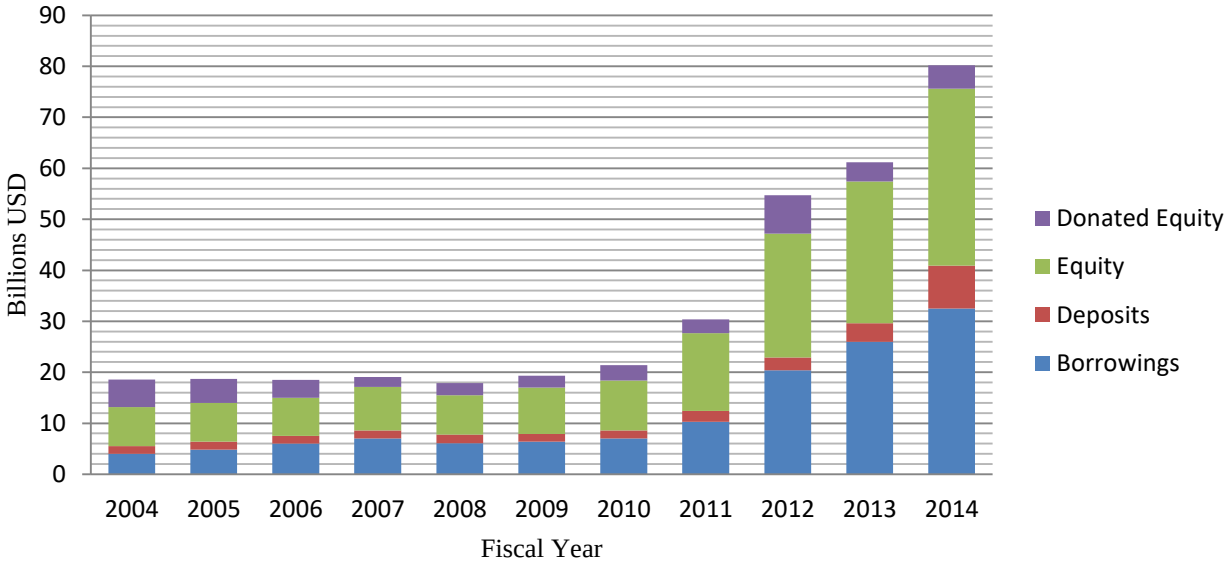
Figure 1.3 illustrates the amount of deposits mobilized by MFIs in USD from 2004 to 2014. There is a steady increase in deposit mobilization to more than 8 billion USD in 2014. Figure 1.4 shows an increase in the rate of borrowings by MFIs to more than 30 billion USD in 2014.

Many MFIs around the world are non-deposit-taken (Galema et al., 2011). With the lack of short-term funding such as deposits and dwindling resources from donors, majority of non-deposit-taken MFIs seek commercial sources of funding, in order to meet the promise of microfinance to alleviate poverty. The proponents of commercialization have encouraged MFIs to be less dependent on subsidies and grant funding (Bogan, 2012; Hoque et al., 2011). The point is that moving towards commercialization may increase the ability of MFIs to expand their scale by leveraging assets (Armandariz de Aghion and Morduch, 2010). Commercialization of microfinance permits MFIs to diversify their funding sources and to be less dependent on subsidies. A recent survey suggests that cross-border funding enables MFIs to diversify their external funding sources. In 2010, local

lenders provided 60% of debt financing to MFIs and 40% was from external investors (MicroBanking Bulletin, 2010).

A survey by MicroRate (2011), shows that debt-financing instruments have been the main source of funding for the microfinance sector for more than five years. They represent 82% of MIV's total assets, while equity stands at 18%. Microfinance investment vehicles (MIVs) are the intermediaries between MFIs and investors. They facilitate access to capital markets by offering several types of financial instruments. However, the nature of MFIs is sometimes a constraint when accessing the capital market, but some MFIs successfully raise equity through the financial markets. For example, in 2007, Compartamos, a Mexican bank, became Latin America's first microcredit bank to go public. SKS Microfinance, India's largest MFI, raised $358 million in an initial public offering in 2010.

Figure 1.5: Funding Structure Evolution, 2004-2014



Source: Mix Market, 2004-2014. See data in Funding Structure Analysis

Figure 1.5 illustrates the breakdown of funding structure of MFIs from 2004 to 2014. In 2004, donated equity comprise over one-fourth of the total funding to MFIs. However, the volume of donated equity shrank over the years. Borrowings comprise of over one-third of the total funding of MFIs, reaching a peak of 32 billion USD in 2014. Similarly, most MFIs rely on shareholder's fund, as deposit mobilization is limited to deposit taking MFIs. The funding structure above calls for better understanding of MFIs capital structure decision-making processes in the face of these expanding financing options.

Despite the array of funding choices available, tapping into these funds is proving to be a challenge. Microfinance access to funding depends on several factors. Anecdotal evidence suggest that firm level determinants play a greater role. For example, Mersland and Urgeghe (2013) provide evidence that commercial debts are related mainly to financial performance and the level of professionalization in the MFIs, whereas international subsidies are driven mainly by social performance. In the same vein, study by Tchuigoua (2014) shows that institutional factors are important when determining MFIs' access to funding. It can therefore be assumed that capital structure of microfinance institutions depends on the internal structure (firm level) and the external environment (institutional environment) in which MFIs operate. Therefore, the impact of these factors on MFI capital structure has provided research opportunities that have inspired this thesis.

1.2. Statement of the research problem

This study focuses on the determinants of the capital structure of microfinance institutions. As MFIs around the world are expanding their outreach and assuming responsibility for increasingly large sums of funds, they face several challenges in the process. One important challenge is ensuring effective governance. Effective governance is often seen as the most challenging and important factor in establishing a strong foundation for the future that guides the management of MFIs in achieving its objectives in a sustainable manner. In 2012 Microfinance Banana Skin report, corporate governance was ranked as one of the topmost pressing risk facing the sector. The report recognized the need for increase input and involvement by the board to ensure effective

management and good governance practices. In order to achieve that, Conger et al., (1999) recognizes that the composition of the board most reflect the complex and unique characteristics of MFIs. The board through its members should possess the necessary knowledge and experience to address the strategic demands facing MFIs.

In this regard, several studies have been conducted to determine how board composition improves corporate governance and its subsequent impact on capital structure using large and well developed firms. Only a fraction of the research on the topic has been devoted to models in which capital structure is determined by board gender diversity (Campbell and Vera, 2010; Alves et al., 2015). Thus, the aforementioned studies do not provide clear guidance in the case of MFI capital structure. In an industry largely catering for female customers, having female directors is likely to affect financing choices (Mersland and Urgeghe, 2013.

Under the continued effects of global financial crisis where donor's investment in microfinance has shrunk, how the economy wide institutional factors affects the financing structure of MFIs have become one of the key debates among practitioners and policy makers. The academic literature has focused on the link between institutional-specific factors and firms capital structure (La Porta et al., 1997; 1998; de Jong et al., 2008; Fan et al., 2012). These studies converge on the idea that better institutional environments reduce information asymmetry in the credit markets, which invariably affects firms' capital structure. However, the impact of the various institutional-specific factors on MFIs access to funding is not clear. Thus, Ahlin et al., (2011) argue that most MFIs operate in small, segmented local markets that are very sensitive to macroeconomic conditions. Understanding the institutional-specific impact on MFIs may also help a growing number of investment funds towards MFIs.

Going further, several studies in the banking sector have decomposed leverage into deposits and non-deposit (borrowings) liabilities. This is because financial firms capital structure fundamentally differs from non-financial firms since its includes deposits, a source of financing generally not available to non-financial firms. However, recent evidence in the banking sector shows substitution effect between deposits and non-deposits liabilities (Gropp and Heider, 2010). Whenever an estimated coefficient is significant, it has the opposite sign for deposit and non-deposit liabilities. This seems to be the case in the microfinance literature (Tchuigoua, 2014). Therefore, examining deposits-borrowing substitutability relationship is warranted.

The substitutability relationship between deposits and borrowing can be explained based on institutional characteristics. It has been documented that MFIs choice of financing is determined by the institutional environment in which they operate. For instance, it is observed that Eastern Europe, Central Asia and Latin American financial markets are characterized by relatively more conducive environment in promoting debt financing, whereas in Africa, the debt market is far less conducive (Galema et al., 2011; CGAP, 2011). However, in the absence of a conducive financial environment for either deposits or borrowings, one can expect that they could be an environment where MFIs are more likely to complement deposits with borrowings together. Therefore, it can be conjectured that there will be an interplay in the decision by MFIs to either undertake borrowing or mobilize deposits. We examine how the substitutability or complementarity relationships vary across different institutional environment. In this case, it is argued on whether MFIs are more likely to displace borrowing with deposits and vice-versa when the institutional environment is no longer favorable.

1.3. Objective of the study

The main objective of the thesis is to examine the determinants of microfinance institutions capital structure around the world. Specific objectives of the study are as follows:

1. To investigate the effect of board gender diversity on MFIs capital structure (Leverage, borrowings, deposits, equity and subsidies).
2. To examine the impact of firm-specific factors on MFIs capital structure (Leverage and subsidies).
3. To examine the impact of institutional-specific factors on MFIs capital structure (Leverage and subsidies).
4. To examine the substitutability relationship between deposits and borrowing and analyse how this relationship can be explained by different institutional settings.

1.4. Research questions

With the above research objectives in mind, this study was set forward to answer the following main questions: What are the determinants of MFIs capital structure? From this main research question, the following specific question were addressed:

1) Does board gender diversity affects MFIs capital structure (Leverage, borrowings, deposits, equity and subsidies)?
2) Is the empirical relationship between board gender diversity and MFI capital structure (Leverage, borrowings, deposits, equity and subsidies) consistent with theoretical predictions?
3) Do the standard firm-specific determinants affect MFIs capital structure (Leverage and Subsidies)? Is the impact of firm-specific determinants equal across countries?

4) Do institutional-specific determinants have significant direct influence on MFIs capital structure (Leverage and Subsidies)?
5) Do institutional-specific determinants have significant indirect influence on MFIs capital structure (Leverage and Subsidies)?
6) What is the empirical relationship between deposits and borrowings? Are they substitute or complements?
7) Does the substitutability or complementarity relationship vary across institutional settings?

1.5. Overview of sample selection, data and research method

This thesis employs an empirical research method using panel data analysis technique. It examines the three identified issues of MFIs capital structure resulting in three studies. For practical reasons, all chapters' employ about the same sample of MFIs, but different sampling periods. The data was limited to MFIs with reporting diamonds four and five disclosure ratings on the MIX dataset for reliability purpose. The study sets 2004 and 2014 as the beginning and end of the sample period. This decision is influenced by the fact that data from previous years are largely missing and fragmented. The implementation of these filters has provided two separate unbalanced panels. Therefore, Chapter 4 which examines the effect of board gender diversity on MFIs capital structure, has a sample of (2400) firm year observation for (584) MFIs across (79) countries covering the period of 2010 to 2014. Whereas Chapters 5 and 6 that investigates the impact of institutional specific environment on MFI capital structure and the joint determinants of capital structure contain a sample size of (5215) firm year observations for (645) MFIs across (56) countries for the period of 2004 to 2014.

Following the approach of many prior studies (Cull et al., 2009; Ahlin et al., 2011; Imai et al., 2012; Bogan, 2012; Tchuigoua, 2014) MFI level data were collected from Microfinance

Information eXchange (MIX). The Mix Market is a web-based platform that provides information on individual microfinance institutions. The Mix market platform is a publicly available platform that shares information relating to more than 1900 microfinance institutions, 200 partners and nearly 100 investors (mixmarket.org). The data that captures aspects of the institutional environment comes from three major sources. The first macroeconomic data were extracted from the World Development Indicators provided by the World Bank. Secondly, the Kaufman et al (2010) World Governance Indicators, and thirdly, a complementary approach that measures institutional characteristics, comes from the Doing business indicators of the World Bank.

Data were analysed using (STATA) 13.1. Appropriate variables in our data were expressed in the natural logarithm of their initial values to adjust for non-normality of distribution. The study employed both univariate (pairwise correlation) and multivariate analysis. Different panel data method of estimation was used to test the research hypothesis. The Heckman instrumental variable model was used to examine the effect of board gender diversity on MFI capital structure. This method allows us to treat any endogeneity issues that may arise between female directors and capital structure variables as observed in prior studies (Alvez et al., 2015; Adams and Ferreira, 2009).

Secondly, weighted least squares regression method is used to determine the impact of institutional-specific factors on MFI capital structure. Following de Jong et al., (2008) regression framework, this method confronts the long held implicit assumption in the literature that firm-specific determinants are uniform across countries. The method used country dummies as a potential solution in the analysis of institutional-specific influence on capital structure, in which case each country serve as a particular observation in the analysis, rather than pooling all MFIs in all countries.

Thirdly, generalised method of moments (GMM) technique developed by Arellano and Bond (1991) and Arellano and Bover (1995) was used to examine the relationship between capital structure variables (deposits and borrowings). This method allows us to examine the dynamic relationship between deposits and borrowing simultaneously using a lagged dependent variable in the equation (Baltagi, 2005). By examining deposits and borrowing simultaneously, the behaviour of the determinants in influencing the decisions can be better ascertained and also the extent to they are substitutes or complement is investigated. As part of robustness check, different variable specifications were used where appropriate. The variance inflation factor (VIF) was used to check for any multicollinearity problem.

1.6. Significance of the study

Given their increasingly important role in most developing countries, it is not surprising that the impact of microfinance in alleviating poverty and reducing financial exclusion remains controversial. Hartarska and Nadolnyak (2008) and Rai and Ravi (2011) show that MFIs improve the welfare of population and alleviate microbusiness financing constraints, whereas Duflo, Banerjee, Glennerster, and Kinnan (2013) find mixed effects of microfinance on poverty reduction and financial inclusion. However, for microfinance to expand outreach and provide sustainable financial services, MFIs need to be financially sustainable (Schreiner, 2000; Hollis and Sweetman, 1998).

Although there have been numerous studies on the sustainability of microfinance, very few have attempted to link capital structure to sustainability. For example, Earne and Sherk, (2013) argue that financing improves financial inclusion by increasing the number of clients and product diversification. Microfinance institutions that access cheap funding may in turn offer cheap loans to their borrowers and income generating activities that leads to sustainable development (Ghosh

& Van Tassel, 2011). Bogan (2012), show how different classes of funding affects MFIs sustainability. Thus capital structure of MFIs has become much more critical issues, understanding the determinants of MFIs capital structure is a major stepping stone to enlighten what should be done if sustainability is to be achieved.

1.7. Major findings of the thesis

The examination of the three issues on MFIs capital structure mentioned above provides some empirical evidence on the relevance of the two competing determinants of MFIs capital structure, namely, the firm level and the institutional level determinants.

Firstly, prior microfinance research has argued that board gender diversity has positive impact on MFIs profitability (Strom et al., 2014; Mersland and Strom, 2009). However, female directors may have different influence on MFIs capital structure relative to MFI performance. To the best of my knowledge, the present study is the first to extend the literature that investigates the link between female board representation and capital structure for a cross-country sample of MFIs. in so doing, empirically investigating the role of female directors contributes to the existing scant literature on microfinance governance and MFIs capital structure.

Empirical evidence on the effect of board gender diversity on MFIs capital structure shows that female directors tend to attract more deposits. This finding lends support to Becker's (1973) matching trait hypothesis in the sense that female directors will improve MFIs savings due to better match with its female customers. Female directors marginally increase MFIs access to subsidies, supporting Pfeffer and Salanciks' resource dependency argument, (1978), which posits that female board of directors seems to play a networking role between the MFI they represent and organizations that provide them with the most beneficial source of funding, in this case donor

agencies. However, the study also shows evidence of risk-taking attitude among female directors when MFIs have three or more of them on board. It also unveils the monitoring attribute of female directors, which leads to lower agency cost of debt.

Secondly, this thesis supplements the existing scant literature on the impact of firm-specific and institutional-specific determinants of MFIs' capital structure (Tchuigoua, 2014; Bogan, 2012). We find that the impact of firm-specific factors such as risk, profitability, liquidity and size on leverage is strong and consistent with standard capital structure theories across a large number of countries. However, determinants such as tangibility and age show unexpected signs. Considering the impact of firm-specific factors on subsidies, the study finds that the impact of tangibility and size on subsidies are consistent with our predictions. However, results from a few determinants remain mixed, and in some countries, some coefficients are significant with an unexpected sign. Furthermore, we find that firm-specific determinants of both leverage and subsidies differ across countries, thereby invalidating the implicit assumption these determinants are equal.

The estimation reveals that institutional-specific factors determine MFIs' capital structure directly and indirectly. In the direct impact, the study observes that higher credit information translates to lower leverage for MFIs, showing the presence of adverse selection in the credit market towards MFI. Higher credit information reveals the non-fully commercial nature of MFIs and the riskiness of the microfinance business. Similarly, the study observes that commercially related institutional-specific factors as found in de Jong et al (2008) are not applicable in the case of MFIs non-commercial capital structure variables such as subsidies. The study also finds the indirect impact of institutional-specific factors on MFI capital structure. The study reveals that strong creditors right mitigates the influence of MFI size in determining leverage. This finding reveals that strong creditors' rights protection may force MFIs to abide by their debt contracts.

This study examines the relationship between deposit and borrowing. Chapter 6 supplements the literature on financial asset substitutability using microfinance evidence. The study makes deposit-borrowing substitutability or complementarity its' focus, and analyses, with the help of dynamic panel data model, the implication of institutional environment on this relationship. Evidence suggests that deposits and borrowings are substitutes rather than complementary. The degree of substitutability is more pronounced in MFI's operating in a developed financial sector. To our knowledge, this is the first study that empirically analyses the substitutability or complementarity of MFIs' financing structure.

1.8. Outline of the thesis

This thesis is divided into nine chapters organised as follows: Chapter 2 provides the theoretical background and research evidence on capital structure determinants. Chapter 3 reviews the literature related to female directors and capital structure. A review of the impact of institutional-specific factors on capital structure is presented in Chapter 4. The chapter discusses the joint determinants of deposits and borrowing. Chapter 5 describes the research methods adopted. The chapter describes the basic structure of the research design and the methodology used to conduct the study, including variable definitions and sample selection procedure. The findings of the study are presented in Chapters 6, 7 and 8. Chapters 6 and 7 report the findings of separate investigations of the determinants of the firm level and institutional level determinants of MFI capital structure, while the result of the joint determinants of MFI capital structure is presented in the later chapter. Finally, Chapter 9 presents an overall summary and conclusion of the thesis, and draws out the implications. The limitations of the thesis and the suggestions for future research are also presented.

Chapter 2 - Literature Review I: Theoretical framework

2.0. Introduction

This chapter presents one of the theoretical backgrounds guiding this study. The chapter presents a thorough review of existing literature of capital structure studies to provide the context for the present study. The next section starts by addressing the capital structure puzzle and tries to explain the traditional theories of capital structure with empirical evidences testing the theories in section 2.2. Section 2.3 presents evidence on firm's capital structure. Section 2.4 narrows the discussion of capital structure literature of microfinance institutions. Finally, Section 2.5 summarises the chapter.

2.1. Capital structure theory

The modern theory of capital structure started from the seminal work of (Modigliani and Miller, 1958) who initiated an infamous proposition of capital structure irrelevance. They argue on the basis that under perfect capital market, zero taxes, homogenous expectations and zero bankruptcy and transaction cost, the value of firm is totally independent of its capital structure. However, many studies, for instance by Jensen and Meckling, 1976; Groosman and Hart, 1972) have discredited most of these assumptions and several theoretical frameworks have been developed to explain the existence of various financing instrument in firm's capital structure. Rather than waiting for sufficient accumulated profits for financing purpose, firms use different financing instrument such as debt, equity or hybrid securities instead. Through this mechanism, the firm could finance its investment and projects which invariably increases the overall firms value.

This study is focused on testing the implications of capital structure and corporate governance theories. Most of these theories have succeeded in explaining several broad patterns in observed capital structure, such as the association between leverage and several firm characteristics and the

aggregate use of different sources of capital. However, neither group of theories has succeeded in explaining much of the observed heterogeneity in capital structures of microfinance institutions.

2.1.1. Trade-off theory

The trade-off theory of capital structure entails that value- maximizing firms achieve an optimal capital structure by striking a balance between the corporate tax benefits of debt and the cost associated with that debt (Agency cost, bankruptcy cost and personal tax) (Kraus and Litzenberger, 1973). In other words, firms dilute these various cost associated with debt with the corporate tax benefit they enjoy. The theory explains the capital structure of firms using leverage and gives a rationale on the various cost (Agency, bankruptcy and personal tax) associated with debt issue. Although, notable corporate finance papers provide empirical evidence to support the trade-off theory Ozkan (2001), Graham et al. (1998), Mackie-Mason, (1990), Bradley et al. (1984) and Schwartz and Aronson (1967). There are criticisms that the theory is not adequately descriptive of observed capital structure (Myers, 1984).

Kraus and Litzenberger (1973) argue that the tax advantage of debt is offset by increased expected bankruptcy costs. Firms with high level of leverage are faced with increasing probability of bankruptcy (i.e. default on interest payment and debt payment) and thus increase the expected bankruptcy costs. The cost may be of different types with varying degrees of damage, for example, firms with high debt in their capital structure would be forced to deal with creditors on less favourable terms which would result in higher financing cost. In this sense, it can be argued that a firm's leverage level represents its degree of riskiness regarding bankruptcy. Therefore, creditors charge higher cost to cover or compensate any loss should the firm goes into liquidation. Consequently, these cost associated with bankruptcy may cause a substantial reduction in firm's value that shareholders prefer not to suffer.

Although, several studies have advanced the argument that optimal capital structure could be achieved by balancing the tax advantage of debt with expected bankruptcy cost (Kraus and Litzenberger, 1973; Stiglitz, 1972). However, some empirical findings have criticized this notion by showing the effect of direct and indirect bankruptcy cost on firms (Warner, 1977). As documented by warner, the cumulative direct costs of bankruptcy are relatively small, at an average of 5.3% of firm's market value. To some extent, the costs are smallest for the larger firms. Moreover, later evidence suggests that both direct and indirect cost of bankruptcy are significant, especially for certain industries (Litzenberger, 1986; Altman, 1984).

2.1.2. Pecking order theory

The pecking order theory was first conceived by Myers (1984) and Mayers and Majluf (1984). They propose a capital structure model based on the information asymmetry problem. The theory deals with the hierarchal structure of capital formation. The problem arises where firm managers are assumed to possess more information about the firm than the investors. As a result, firm's equity may be mispriced by the investors due to lack of better information, thereby resulting in an inefficient investment decision by firms due to under-investment problem. Under-investment has a tendency to make firm managers to forego profitable project. Thus, in a situation where equity is under-priced, firms can capture the benefit of investing in a positive project by having new investors rather than the existing shareholders.

Therefore, in order to mitigate these inefficiencies, it is suggested that firms should design their capital structure in a hierarchy of financial securities that is not severely under-priced by investors such as retained earnings or debts. So the pecking order theory predicts that due to asymmetric information, firms prefer internal source of funding than external. In a situation where external funding is necessary, firms prefer debt over equity because the information cost associated with

debt issue is lower compared to equity issues. The optimal capital structure of firms depends on the information available to investors and the investor's ability to monitor and enforce compliance through institutions (Demirguc-kunt and maksimovic, 1999; Booth et al., 2001; Antoniou et al., 2008; Li and Ferreira, 2011; Fan et al., 2012).

2.1.3. Agency theory

The agency theory paradigm was initiated in the early 1970s by Ross, (1973) and Jensen and Meckling, (1976). They study the agency relationship and the cost arising out of the conflict between an agent and his principal. The inherent conflict of interest can exist between either shareholders and managers or shareholders and debtholders. In the case of conflict between shareholders and managers, the theory suggests that managers may prefer to pursue their own personal objectives as against the interest of their shareholders, that is to maximize shareholder's wealth. In order to reduce agency cost, firms therefore, introduce debt into their capital structure.

The choice of using debt instrument starves managers of free cash, while on the other hand pressurizes them to generate cash flows used in settling interest expenses and full debt repayment upon maturity (Jensen,1986). Besides, Grossman and Hart (1982) argue that debt contracts encourage firm managers to be efficient in order to meet their debt commitment or otherwise risk losing their jobs and reputation in the event of firm liquidation. Because debt imposes constraints on managerial discretion, agency theory suggests that managers may be motivated to adopt sub-optimal leverage that does not maximize shareholders' wealth. The extent to which managers can take on suboptimal leverage depends critically on the strength of corporate governance. Fama and Jensen (1983) suggest that strong corporate governance characterised by efficient board monitoring and guidance plays an essential role in mitigating agency conflicts.

2.1.4. Stakeholder theory

Stakeholder theory suggest that a firm is characterized by relationships with many constituent groups and individuals (Stakeholders) each with the power to affect firm's performance and decision making. The theory is concerned with the nature of these relationships in terms of both processes and outcomes for the firm and its stakeholders (Freeman, 1984). However, with more influence of stakeholders in firm activities, it is difficult to state the role of stakeholders in determining firms capital structure. Implicitly, Cornell and Shapiro (1987) suggest that the inclusion of the interest of other stakeholders in the action of the firm leads to "new interpretation of classic problems in finance". A good example of such problem is financing decision.

Titman (1984) was first to point out that the stakeholder's incentives affects firms financing decision. Titman & Wessels (1988) argue that the indirect costs of distress can be high when distress to a given firm would bring about difficulties for its customers (who are hesitant to purchase from a company that might default and not be around to service the product) or suppliers (who might not supply a product to a firm in or near distress). Banerjee et al. (2008) use customer/supplier data from the Compustat Business Information File (which runs only through 1999) and find that companies use less debt when their suppliers are "dedicated". This behaviour is consistent with customers considering their own financial distress risk as a cost to the supplier (perhaps because dedicated suppliers will attempt to charge high-debt customers more). Leverage also increases risk for another important stakeholder: employees, who are exposed to unemployment risk in the event of bankruptcy. This (indirect) cost of financial distress is ultimately borne by the company in the form of higher wages (Berk et al. 2010) and thus discourages the use of debt in a trade-off sense.

2.1.5. Other corporate governance theories

A number of different theoretical frameworks have evolved to explain and analyse the relationship between corporate governance and firm capital structure. Each of these theories approaches corporate governance in a slightly different way, using different terminology, and views corporate governance from a different perspective and discipline. Although there are clear differences between the various theoretical framework, however, they each attempt to analyse the same issue of board effectiveness. They sometimes provide the most convincing basis to analyse the effect of corporate governance on firm capital structure.

Resource dependency theory originates from the study of external control of organizations by Pfeffer and Salancik (1978). The theory emphasizes the interdependence between organizations and entities in their external environment that control important resources. Pfeffer and Salancik (1978) developed the idea that firms can form links with elements of its external environment upon which it depends. They argue that board of directors are important linkage mechanism for connecting a firm with sources of external dependency. By selecting a director with valuable skills, influence, or connections to external sources of dependency, the firm can reduce dependency and gain valuable resources. As environmental dependencies change, so do the resource needs for organizations and thus the needs for specific types of directors (e.g., Hillman et al., 2000).

Empirical evidence has confirmed firms observe increase in leverage when they have more board members representing financial institutions (Pfeffer, 1972). Similarly, Booth and Deli (1999) find that the inclusion of commercial bankers on corporate boards to have positive relationship with short term and long term debt, and total bank debt of the firm. Other studies have as well studied the expertise of board directors. Moreover, the choice of having a particular director or balancing their expertise may determine the optimal capital structure of firms.

Similarly, the debate on critical mass theory can be traced back to the seminal work by Kanter, (1977), which analyse the experience of women who form small minorities in corporate boards and political spheres. Although the study is concerned with how women respond to dynamics of marginalization in minority situations and conclude with some speculation as to how these experiences will change as the number of women increases. The critical mass theory on board gender diversity hypothesises that "one is a token, two presences, and three is a voice" (Kristie, 2011). Kramer et al (2007) point out that "the magic seems to occur when three or more women serve on board together. They find that having three or more female on board can create a critical mass where female directors are no longer seen as outsiders and are able to influence the content and process of board discussions more substantially". It is clear that having three or more female directors on board improves board effectiveness and decision making. Therefore, linking this decision to firm capital structure decisions is subject to investigation.

2.2. Capital structure evidence

Capital structure research also takes the form of empirical research not only theoretical propositions. Empirical research is carried out to test the validity of theoretical predications which findings are often mixed and generally not consistent with the theoretical predictions. As a result, researchers have suggested that there no dominant theory that can explain the behaviour of firm's capital structure mix (Beattie et al., 2006). They argue that capital structure policies of firms are heterogeneous and that some firms do not follow the capital structure theories when deciding on their capital structure mix. Therefore, the applicability of some of these theories in the finance world is debatable.

There is considerable amount of literature on firm's capital structure (Gungoraydinoglu and Oztekin, 2011; Gropp and Heider, 2010; de Jong et al., 2008; Frank and Goyal, 2004; Booth et al.,

2001; Demirguc-Kunt and Maksimovic, 1999; Rajan and Zingales, 1995) depending on the relevant theoretical considerations (Bankruptcy cost, agency cost, information asymmetry), one can point to two major determinants of firm's capital structure, that is, firm-level and institutional specific determinants.

An early study Marsh (1982) measures the probability of issuing debt based on firm's characteristics. He finds that firm with high level of fixed assets and of large size is highly likely to issue debt, while an increase in bankruptcy probability will reduce the probability to issue debt. Rajan and Zingales (1995) examine the determinants of firm capital structure in an international context. Overall, they find that tangibility of assets, firm size, profitability and growth opportunities are important determinants of firm capital structure. Recent study by Antoniou et al., (2008) supports the findings of Marsh (1982) on level of fixed assets and firm size and oppose Rajan and Zingales (1995) on profitability and growth.

In the banking sector, Gropp and Heider (2010) find evidence that the standard cross-sectional determinants of non-financial firm's capital structure are also applicable to financial firms such as banks. The sign and significance of the effect of most variables on bank leverage are identical when compared to the results found in Frank and Goyal (2004) for US firms and Rajan and Zingales (1995) for firms in G-7 countries. However, other interesting firm-level determinants appear to be closely related with capital structure decision. One recent area that has received much attention in the firm-level determinants of capital structure is the corporate governance issues.

Several empirical studies have focus on the relationship between capital structure and corporate governance characteristics such as board size, board composition and management compensation (Haque et al., 2011; Ortiz-Molina, 2007; Wen et al., 2002; Berger et al., 1997; Mehran, 1992;

Friend and Lang, 1988; Jensen, 1986; Pfeffer and Salancik, 1978). Rather recently, there is a reduced focus on board gender diversity and firm capital structure (Alvez et al. 2015; Campbell and Vera, 2010). These studies argue that gender diversified board to be more efficient and contribute to lower information asymmetries and increase the firm proportion of risky securities on its capital structure. Evidence show that boards with more women have greater level of public disclosure and better oversight of management reporting that enhances earnings quality (Gull et al., 2011).

Similarly, women on corporate boards are found to improve monitoring and board quality (Adams and Ferreira, 2009; Carter et al., 2010). However, Fama and Jensen (1983) and Lorca et al. (2011) argue that effective board monitoring and higher quality of board decision plays an important role in reducing agency cost of debt. They argue that board of directors monitoring role leads to a decrease in opportunistic behaviour of managers (agency cost) and information asymmetry. However, other behavioural and organizational theories may explain the effect of female board representation on firm capital structure choice (Jacobsen et al. 2014; Jianakoplos and Bernasek, 1998; Pffer and Salancik, 1978; Kanter, 1977).

Turning now to the role of institutional-specific factors in determining firm capital structure. It is observed that the choice of financing reflects actual and perceived transactions cost of resolving asymmetric information (La Porta et al., 1997, 1998; Demirguc-Kunt and Maksimovic, 1999; Booth et al., 2001; Antoniou et al., 2008; Li and Ferreira, 2011; Fan et al., 2012). They converge on the idea that better institutional environment reduces asymmetric information problem between firms and investors.

2.3. Microfinance institutions capital structure evidence

In relation to the microfinance sector, there has been arguments that the application of standard capital structure theories and models to lending institutions such as microfinance institutions is not that straightforward. Cohen (2004) argued that corporate finance principles is only applicable to lending institutions after accounting for differences in how they operate. For instance, microfinance institutions are unique type of lending institutions with risk and return characteristics different from corporate firms. As Cebenoyan and Strahan (2004) observed, risk management greatly influences the capital structure of lending institutions. Therefore, the theoretical prediction behind the determinants of firm capital structure may not clearly explain the diverse nature of MFIs capital structure.

Existing studies that examine the effect of capital structure on microfinance can at least be categorised into five different groups. The first category examines whether financing choice improves MFI financial sustainability and efficiency (Kyereboah-coleman, 2007: Hoque et al., 2011; Hudon and Traca, 2011: Bogan, 2012). Kyereboah-Coleman, (2007) show that highly leveraged MFIs perform better socially and enjoy economies of scale by using panel data of 52 MFIs in Ghana. On the contrary, Hoque et al., (2011) present a robust result that indicates negative relationship between leverage and MFIs outreach. Hudon and Traca, (2011), find that subsidies have a positive impact on MFIs efficiency. Furthermore, Bogan (2012) explores how changes in capital structure could improve MFI efficiency and financial sustainability using the life cycle theory. They find causal evidence that increased use of grants by large MFIs is negatively related to sustainability and drags down operational self-sufficiency.

The second category explores the effect of rating on MFIs access to capital. Hartarska and Nadolnyak, (2008) show that the impact of rating agencies differs on MFIs ability to raise capital.

The result also suggests that subsidizing rating does not help MFI raise more capital. Garmaise and Natividad, (2010), show that rating cuts the cost of financing to MFIs while the impact of supply of credit is mixed. The third category examine the determinants of external funding and find evidence that financial performance and social performance variables are more likely to influence external funding to microfinance institutions (Mersland and Urgeghe, 2013). The fourth category draw inspiration from the life cycle theory and describes MFI funding choices to their stages of development (Fernando, 2004; de Sousa-Shields and Frankiewicz, 2004; Ledgerwood and White, 2006).

Finally, the fifth category addresses the question of whether institutional frameworks affect capital structure of MFI. Tchuigoua, (2014), used a sample of 292 MFI's across the world. Findings suggest that strength of legal rights drives MFI's external debt and donated equity. MFIs in countries with developed banking sectors are more levered. This interesting result seems consistent with previous studies (de Jong et al., 2008). This might suggest the evidence of similarity of capital structure determinants between financial and non-financial firms as suggested by Gropp and Heider (2010).

2.4. Summary

The chapter provides the theoretical framework guiding this research. The chapter also reviews the literature on the present state of art of MFIs capital structure. Generally, it can be observed that the research evidence on the determinants of MFIs capital structure is mixed and far from conclusive. Nevertheless, the richness of the literature on capital structure determinants of firms highlights the importance of the issue in the microfinance context.

Chapter 3 - Literature Review II: Board gender diversity and capital structure of MFIs

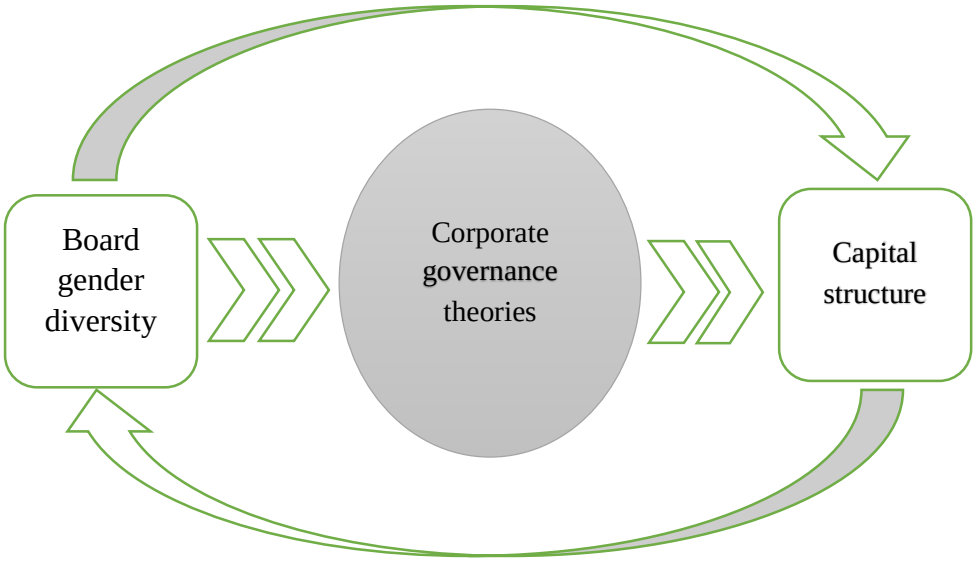
3.0. Introduction

This chapter reviews the effect of board gender diversity on MFIs capital structure. We begin the chapter by explaining the conceptual framework for board gender diversity and MFIs capital structure in section 3.1. Section 3.2 presents related theory that explains how female directors affect microfinance institutions capital structure. Empirical evidence on female director's effect on different firm outcomes is presented in Section 3.3. Section 3.4 presents prior evidences on other firm level determinants of MFI capital structure. The research question is presented in section 3.5 and 3.6 summarises the chapter.

3.1. Conceptual framework for board gender diversity and capital structure

From the corporate governance theories presented in Chapter 2, we summarise the relationship between board gender diversity and microfinance institutions capital structure in the following conceptual framework.

Figure 3.1: Conceptual framework on the effect of board gender diversity and MFIs capital structure



The conceptual framework in Figure 3.1 indicates two-way relationship between board gender diversity and MFI capital structure. Several empirical studies have argued that female directors and capital structure are jointly endogenous (Hermalin and Weisbach, 2003; Farrell and Hersch, 2005; Adams and Ferreira, 2009; Carter et al., 2010; Sila et al., 2016). While female directors could affect capital structure of microfinance institutions, the capital structure influences board gender diversity as well. This relationship can be explained in four distinct ways. First, is the resource dependence argument that seeks to link firm board of directors to the most beneficial resources in their environment (Pfeffer and Salancik, 1978). Second, the critical mass perspective, where female directors have influence on corporate board decisions and those influence should be more pronounced when critical mass of three or more female directors is reached (Kramer et al., 2007; Konrad et al., 2008; Joeks et al., 2013). Third, reducing agency problems due to female director's partial substitute effect on weak corporate governance (Gull et al., 2011). Finally, the implication of risk aversion attitude of female directors towards financing choice (Sila et al., 2016; Chen et al., 2016).

According to corporate governance literature, the definition of female director is sensitive to firm outcomes. The following definitions are necessary; indicator variable being one for the presence of female directors on board, fraction of female directors, absolute number of female directors and indicator variable being one if the number of female directors is equal or larger than three. Other firm level variables that may control for the effect of board gender diversity are; return on assets (ROA), board size, MFI-size, age and risk. The empirical theory indicating the relationship between board gender diversity and MFI capital structure is presented in next section.

3.2. Board gender diversity and corporate financing

In relation to the firm level determinants of capital structure, this section extends the discussion of the effect of board characteristics on corporate financing. It deserves special mention because the present study considers board gender diversity as one of the bases for explaining the determinants of capital structure. Although the latest evidence from the field shows that female directors has importance influence in firm capital structure decisions (Alvez et al., 2015; Campbell and Vera, 2010). An empirical finding by Campbell and Vera (2010) examine the effect of legislative changes in Spain on positive discrimination in favour of female board appointment and gender equality act. They find that stock market reacts positively in the short-term to the announcement of female board appointments, suggesting that investors on average believe that female directors add value. Similarly, Alves et al., (2015) studied 2427 firms in 33 countries and found that more gender diversified board leads to a capital structure composed with more long term funding. To our knowledge, these are the first studies that establish link between board gender diversity and capital structure.

There is little or no attempt to find empirical evidence linking board gender diversity and microfinance institutions capital structure. A substantial amount of literature links female leadership to observable MFIs outcomes. This study contributes to this literature by examining whether female board of directors affects MFIs capital structure. This is an important research question. Recently, firms in various industries have come under intense public pressure to increase female representation on boards[1], and number of European countries (among them France, Norway and Italy) have passed legislation mandating more female board representation for certain firms.

[1]The recently launched Bloomberg Financial Services Gender-Equality Index (BFGEI), which was developed in collaboration with the Women's World Banking, helps to facilitate the benchmarking and comparative tracking that is critical to measuring performance.

The microfinance industry is particularly suited for studying the impact of female directors because of its mission orientation and high percentage of female leaders. This is because, the representation of female directors on boards is higher in microfinance industry compared to corresponding figures in other industries[2]. However, the economic consequence of more female directors on boards is not well understood.

3.2.1. Resource dependency theory and board gender diversity

Pfeffer and Salancik (1978) argue that board of directors seeks to link organization to other external organization in order to address environmental dependencies. They advocate four important benefits for these linkages which include: (1) provision of external resources such as information and critical expertise (2) creation of communication channels with other important stakeholders to the organization; (3) Provision of commitments of support from external organizations; and finally (4) provides legitimacy for the firm in their external environment. Hillman et al (2000) develop these four benefits derived from the theory into a classification of various director types that sought to attract various beneficial resources to the firm. Therefore, a more diverse corporate board is expected to offer resources that are more valuable to the firm.

Moreover, the type of board diversity seems to be very important. For example, Pfeffer (1972) finds a positive relationship between the percentage of board members representing financial institutions and leverage. This result advocates the notion that financial institutions that provide capital to firms hold back their funds, unless firms allocate a position to them on their boards. Similarly, Booth and Deli (1999) find that the inclusion of commercial bankers on corporate boards

[2] For example, in our sample, 30% of all board of directors are women

to have positive relationship with short term and long term debt, and total bank debt of the firm. They also find that commercial bankers create links and supply expertise to the bank debt market.

In another interesting study, Agrawal and Knoeber (2001) find that politically experienced outside directors are more likely to be on the corporate boards where sales to government is greater. Similarly, they find that female directors bring different benefits and resources, but find little evidence that female directors play any political role. Siciliano (1996) show that boards with increased female directors is more likely to enjoy high level of social achievements, but less likely to achieve fundraising goals. Hillman et al (2007) find that female representation on board is always related to firm diversification strategy, type of industry and the network of linkages to female directors in other boards.

Resource dependency theory may provide the foundation for some of the most convincing and interesting theoretical arguments for a gender diversified corporate boards. As Carter et al., (2010) suggest that diversity holds the potential to improve the quality of information between the board of directors and managers due to the uniqueness of information held by diverse directors. It is assumed that gender diversity will likely produce unique and important information that can help management to make better decision. Female directors may provide access to the most important organizations in the external environment. For instance, female directors may seek linkages with the most beneficial resources in their environment. Some may seek to maintain good relationship with female customers or employees.

Some firms may require female perspective in board decision making such as financing decisions. Other firms may add female directors to their board in order to seek legitimacy from external organizations. However, the creation of this link is important in the microfinance sector, since

microfinance is largely a female business. Hence, female directors in the microfinance sector may send an important signal to product market, labour market and sometimes the capital market. In sum, the theory point to the beneficial linkages of female led MFIs to resources in its surrounding. We therefore, hypothesize to test the effect of female directors in attracting a particular class of funding.

3.2.2. Critical mass theory and board gender diversity

The critical mass theory on board gender diversity hypothesises that "one is a token, two presences, and three is a voice" (Kristie, 2011). Kramer et al (2007) point out that "the magic seems to occur when three or more women serve on board together. We find that having three or more female on board can create a critical mass where female directors are no longer seen as outsiders and are able to influence the content and process of board discussions more substantially". Konrad et al (2008) interviewed 50 women about their experience as fortune 1000 directors and drew the same conclusion. Similarly, Joeks et al (2013) find evidence that female directors at first negatively affect firm performance but reverses to higher performance only after a critical mass of 30% has been reached or absolute number of about three female directors in their sample. Hence, they support recent studies on a corresponding "magic number" of female directors in the boardroom. Therefore, if female directors should have any impact on corporate decisions making, such impacts could be more strong and pronounced when the critical mass is reached.

3.2.3. Agency theory and board gender diversity

In corporate settings, firms suffer from an incentive problem, simply because those who run the firm are not the same as those who own the firm (Jensen and Meckiling, 1976). One solution is to enhance monitoring by corporate board. Fama and Jensen (1983) argue that improved board monitoring and guidance reduces opportunistic behaviour and conflict of interest. Empirical

evidence from corporate boards suggest that female directors tend to be more active in monitoring activities. For example, Carter et al. (2010) show that gender diversified boards can improve its monitoring efficiency. Adams and Ferreira (2009) document that female directors attend more board meetings. In a similar view, Gul et al (2008) and Alvez et al (2015) show that firms with more female directors have high monitoring, greater level of public disclosure and better managerial accountability.

The other effect of female directors on corporate decision is subject to firm's governance quality. Adams and Ferreira, (2009) argue that in a well governed firms, female directors can negatively affect firm value due to excessive over-monitoring. On the contrary, Gull et al., (2011) suggest that firms can to some extent remedy their weak governance by having high female directors on board. This seems to be the case with MFI's. Strom et al (2014) find a negative relationship between female leadership and governance mechanisms. This means that MFI's with more female directors perform better with less monitoring and oversight because female leadership is decisive in the microfinance sector and may substitute for weak governance. Hence, female directors may have beneficial effects on microfinance decision making due to the aforementioned partial substitute effect. A more gender diversified board remedies MFIs weak governance, which may invariably lower their agency cost.

3.2.4. Risk aversion and board gender diversity

Prior studies in both behavioural and financial economics have shown that increasing representation of women in the boardroom is a way to reduce risk. Numerous empirical evidence has shown that women are found to be more risk averse than men (Barsky et al., 1997; Jianakopolos and Bernasek 1998; Bernasek and Shwiff, 2001; Sila et al., 2016; Chen et al., 2016). For example, Byrnes et al., (1999) conduct a meta- analysis of 150 studies on risk taking behaviour

between men and women. They show that men are more likely to be involved in 'risky experiment', 'gambling' and 'intellectual risk taking' than women. Furthermore, women are found to be more conservative in investment decision-making (Sunden and Surette, 1998). Croson and Gneezy (2009) provide more evidence in this area by reviewing literatures on gender difference using an economic experiment, they show a robust finding that women are more risk averse than men.

Recent studies on risk attitude of women in the general population show that men are more overconfident than women are. While men tend to believe the precision of their knowledge about risk higher than it is, women exhibit less overconfidence and thus are less likely to take extreme positions (Ray, 2005). Similarly, Huang and Kisgen, (2013) find evidence that suggests men exhibit relative overconfidence in significant corporate decision-making compared with women. Contrary to these views, Deaves et al., (2009) do not find women to be less overconfident than men in a sample of economics, finance and business students. They hypothesize that women who are engaged in predominantly male disciplines may behave differently from other women in the general population. In situation like this, female director's characteristics play a great role in helping them climb the corporate ladder and becoming a director. For instance, Adams and Funk (2012) suggest that the level of risk aversion in female directors may disappear once they have broken through the glass ceiling and have adapted to a male male-dominated culture. They performed an asset market experiment to investigate how gender influences trading activity through overconfidence on Swedish sample. They find female directors are more risk seeking than male directors.

This behavioural gender difference in equity holding is often attributed to women being risk averse to financial risk in the literature. Jianakoplos and Bernasek (1998) document that single women

invest on average 40 percent of their wealth in risky assets, which is less than the 46 percent than men do. Similarly, in a cross-sectional sample of boards of directors of 1024 publicly traded firms, Adams and Ferreira (2004) find that firms facing more variability in their stock returns have less female representation on their boards. Wilson and Altanlar (2011) find insolvency risk to be negatively related to the proportion of female directors on boards.

More recently, Jacobsen et al., (2014) investigate why men hold more stock than women using the hypothesis that gender differences in either optimism or perceived risk of financial market may cause men to hold riskier assets. They find that women on average believe that stocks are riskier than men do. Contrary to those findings, Sila et al (2016) show that most findings of a negative relationship between women and equity risk are spurious and driven by unobserved between firm heterogeneous factors. Using a dynamic model, they find no evidence that the presence of female directors in the boardroom influences equity risk.

A recent study on risk measurement using U.S. sample show that board with more female directors reduce the positive relation between R&D risk and earnings/returns volatility. In addition, they find that the adverse effect of R&D risk on cost of debt is less severe when more female directors are on the board (Chen et al., 2016). As might be expected, Khaw et al., (2016) show that having male-only boards increases corporate risk taking behaviour significantly. However, Sila et al., (2016) show that a board with a higher percentage of female directors is no more or less risk-taking than a more male-dominated board. It is evident that, studies on the impact of female on financial behaviour shows varied results. Moreover, the consensus is that risk attitude varies between genders and that board gender diversity can explain firm outcomes.

However, none of these studies has established the relationship between risk behaviour of female directors and capital structure. Overall, the results of (Adams and Ferreira, 2004; Farrell and Hersch, 2005; Adams and Ferreira, 2009; Liu et al., 2014; Sila et al., 2016) confirm that female directors on board are not exogenous random variables and that endogeneity problem is likely an issue when investigating the impact of female directors on firm's outcome. Studies by Mersland and Strom (2009) and Strom et al., (2014) both encounter two endogeneity issues when investigating the impact of female directors on microfinance settings. We expect the same potential endogeneity problems when investigating the impact of female directors on MFI's capital structure.

3.3. Other empirical evidence on female directors

Compared to their male counterparts, female possess many favourable traits that adds value to their firm. As a result, female directors are capable of playing a better monitoring and advisory role in the board that can lead to positive outcomes (Adams and Ferreira, 2004). Academic research has provided supportive evidence in this regard. For example, Adams and Ferreira (2009) examine the relationship between female directors and governance on one hand and performance on the other. They find positive relationship between female directors and performance, only when firms show weak corporate governance structure. Furthermore, Smith et al., (2006), and Francoeur et al., (2008) show that female on top management tend to have positive effect on firm performance. Welbourne et al., (2007) find that short and long-term financial performance improves when women are in the top management when firms issue an initial public offering (IPO).

More recently, Liu eta al., (2014) document a positive and significant relationship between board gender diversity and firm performance in China's listed firms. Female directors have stronger positive effect on firm performance than female independent directors do. Gulamhussen and Santa

(2015) assess the role of female directors in banks boardroom in a sample of 461 large banks from OECD countries. They find a positive influence of women in boardrooms measured by presence and percentage with financial performance variables (return on assets, return on equity and operating income ratio).

Other studies report contradictory findings. For instance, Shrader et al. (1997) find negative relationship between percentage of female directors and firms performance measured by ROA/ROE. Similarly, Farrell and Hersch (2005) show that appointing a director is not gender neutral and that the market does not significantly reacts to the appointment of a female director. Recently, Gregory-Smith et al., (2014) use UK data to examine the issues regarding the scarcity of representations in boardrooms. However, they find no support to the arguments that female representation in boards enhances corporate performance. Performance is measured by return on assets (ROA); return on equity (ROE), total shareholder returns (TSR) and the logarithm of the price-to-book ratio (LnPTOB) used as a proxy to Tobin's Q. However, these studies cited above used data from diverse industries and mostly in developed countries.

When it comes to studying the impact of female directors on microfinance institutions, most studies are limited within the framework of microfinance performance model and focus on testing the hypothesis of association between performance and female leadership. Mersland and Strom, (2009), report that financial performance improves with female CEO, local directors and internal board auditors. Similarly, Strom et al., (2014) investigate the relationship between female leadership and firm performance using a global panel of 329 MFIs in 73 countries. They find female leadership to be positively related to MFI performance, but not driven by improved governance.

Other studies examine microfinance institutions performance and the main characteristics of corporate governance. Hartarska, (2005), find that performance based compensation does not improve MFIs performance. The results also identify trade-off between MFI's social and financial performance depending on stakeholder representation on boards. Furthermore, using stochastic cost frontier estimation, Hartarska and Mersland, (2012) find that efficiency increases with board size, whereas MFIs in which the CEO chairs the board decreases efficiency. These identified studies seem to overlook the impact of female directors on MFIs capital structure and this relationship has not yet been subject of investigation in the microfinance field. Our study intends to fill the gap by examining weather female on boards determines for MFI financing decisions.

3.4. Other firm-level determinants of capital structure

Prior empirical studies on microfinance institutions have identified several MFI-level determinants that explains MFI outcomes based on various theoretical considrations. For instance, board size has been identified as an important firm level determinant of corporate financing decisions. Jensen (1986) finds that larger board size is positively related to higher leverage. On the contrary, Berger et al (1997) show a consistent negative relationship between board size and leverage across all their six regression models. Meaning to say leverage measured by total debt divided by total assets is lower when board size is larger. Wen et al (2002) show a positive though statistically insignificant relationship between board size and financial leverage of 60 Chinese listed firms for the period of 1996 to 1998. Anderson et al., (2004) and Lorca et al., (2010) find that cost of debt financing is negatively associated with board size, suggesting that larger boards are synonymous to high level of managerial monitoring, increased decision making time and poor communication. More recently, Alves et al (2015) empirically analyse the association between board size and capital 8 different capital structure measures. They find statistically significant relationship

between market and book values of short term debt and long term debt. This means firms with larger boards have more long-term debt and less short-term debt. Meaning to say larger boards reduces information asymmetry.

The relationship between financial and social performance and MFIs access to funding was first investigated by Mersland and Urgeghe (2013) using data from 319 MFIs in 68 developing countries. Financial performance (measured as ROA) increases MFIs access to international commercial debt. Consistent with this view, Bogan (2012) find that commercial investors target more robust and profitable MFIs. This also confirms the observation made by many that Microfinance Investment Vehicles (MIV) target the "niche" of financially profitable MFIs (De Schrevel et al., 2009; Wiesner and Quien, 2010). This supports the view commercially funded MFIs respond to the profit incentive, working to increase revenues and decrease expenses so that they can have revenues sufficient to cover all operating expenses. Regarding social performance, Mersland and Urgeghe (2013) find a significant negative relationship between the presence of commercial funding and the targeting of women by the MFI. Thus, commercial MIVs do not consider reaching women a priority. However, they find positive relationship between subsidized international debt and MFIs social performance (measured by female bias).

Size is another important firm level determinants of capital structure. Studies on firm capital structure (Rajan and Zingales, 1995; de Jong et al., 2008) argue that large firms have low bankruptcy cost and more diversified portfolio with less probability of bankruptcy than small firms. This is seems to be the case in microfinance literature (Bogan, 2012; Tchuigoua, 2014). Existing research on the impact of MFI age on financing pattern is centered within the context of life cycle theory (de Sousa-Shields, 2004; Bogan, 2012). Generally, the life cycle theory hypothesize that MFI sources of financing are linked to their stages of development. Subsidies

such as grants and donations comprise the bulk of funding in the early formative stage of MFIs (Armendáriz de Aghion and Morduch, 2005). Debt funding becomes available as MFIs mature, while equity financing becomes available when MFIs are in their last stage of evolution (Fehr and Hishigsuren, 2004). Risk is mostly measured by outstanding loans portfolio in the microfinance sector. MFIs with high risk means higher volatility of earnings and higher probability of bankruptcy. According to Tchigoua (2015), the quality of MFIs loan portfolio provides information on the effectiveness of the devices for credit risk management implemented by the MFIs. Thus, we infer that MFIs with low portfolio risk are considered as less risky by creditors and donors.

3.5. Research questions

This chapter links board gender diversity to MFIs capital structure. The reviewed emperical literature in this chapter provides mixed results on the effect of female directors on firms capital structure. Some firm level determinants where found to be significantly affecting firm capital structure in one economy or applicable to a set of MFIs in some studies and were not significant in other studies. Thus making it unclear about the impact of firm level determinants, particularly female directors on MFIs capital structure. In an attempt to fill this knowledge gap the data analysis and the discussion of the findings in this chapter are focused to answer the following specific research questions as introduced in Chapter 1:

1) Does board gender diversity affect the capital structure of microfinance institutions?
2) Is the empirical relationship between board gender diversity and MFI capital structure consistent with theoretical predictions?

3.6. Summary

This chapter has presented a comprehensive literature on the impact of firm level determinants of capital structure with special emphasis on the role of female director on firm capital structure. Generally, it can be observed that the research evidence on female director's effect on capital structure is somewhat little, with mixed findings and far from conclusive. Overall the literature suggests that capital structure models that ignore governance features are incomplete. We take a step further to analyse the relationship between female board representation and MFI capital structure.

Chapter 4 - Literature Review III: The impact of firm-specific and institutional-specific determinants on MFIs capital structure

4.0. Introduction

This chapter extends the study of MFIs capital structure. Utilizing a different regression framework, the impact of firm-specific factors and institutional-specific factors on MFIs capital structure is investigated. The chapter begins by explaining the conceptual framework of these impacts in section 4.1. Section 4.2 presents the empirical evidence on the impact of firm-specific factors on MFIs capital structure around the world. Section 4.3 presents evidence on the impact of institutional-specific factors on MFIs capital structure. More specifically, the section reviews the direct and indirect impact of institutional-specific factors. Section 4.4 extends the discussion on the joint determinants of deposits and borrowings. Specifically, the section presents the conceptual framework explaining this relationship. Research question are presented in section 4.4. Evaluation, critique and gaps of the existing literature is given in Section 4.5. Section 4.6 summarises the chapter.

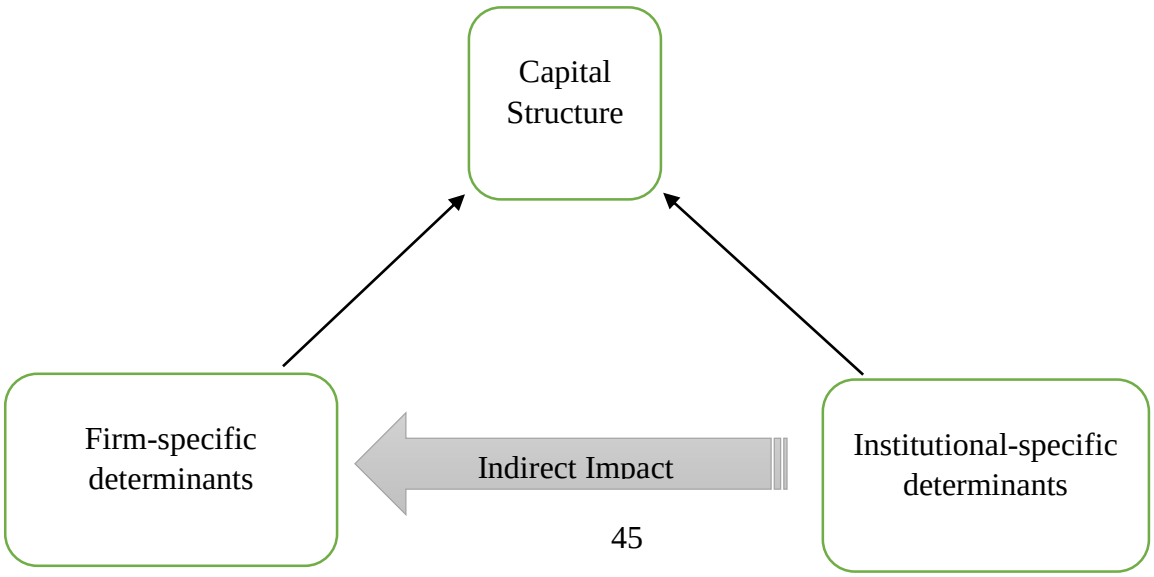
4.1. Impact of firm-specific and institutional-specific determinants: Conceptual framework

According to existing literature in corporate finance, firm financing decision is not only determined by firm-specific factors but also by institutional environment in which the firm operates (Demirguc-Kunt and Maksimovic, 1999; Booth et al., 2001; de Jong et al., 2008). The firm-specific factors are internal to the MFI, and therefore are controllable within the MFI. These factors include: tangibility, profitability, liquidity, portfolio at risk, MFI size and age of MFI. The impact of firm-specific factors on capital structure may vary from one country to the another. The institutional-specific factors are external factors that are beyond MFIs control. Example of the external factors are where government through its regulating body sets capital control beyond

which MFIs are not allowed to access; and where the government give licence for MFIs to mobilise deposits. Some of the institutional factors are; strength of creditors right, presence of credit registry, financial sector development, country legal origin, Political stability, Prudential regulation and GDP growth.

In this chapter, we cover the impact of firm-specific factors on MFI capital structure, indicating whether they differ across countries. Similarly, we cover the direct and indirect impact of institutional-specific factors on MFI capital structure. Figure 6.1 depicts the relationship capital structure and both firm-specific and institutional-specific factors. It indicates that, firm-specific factors influence MFIs capital structure (leverage and subsidies). Similarly, MFI operating in a better institutional environment may benefit from easier access to funding. The main argument is that better institutional environments can overcome information asymmetries in the credit market and consequently affect MFIs capital structure. The framework depicts institutional factors directly affects capital structure and indirect impact capital structure through their impacts on the effect of firm-specific factors.

Figure 4.1: Conceptual Framework on the impact of firm-specific and institutional-specific factors on MFI capital structure



4.2. Firm-specific factors and capital structure

Several empirical studies have ultimately observed that the capital structure of financial and non-financial firms are determined by various firm specific variables arising out of static trade-off theory, pecking order theory, agency theory and profit incentive framework (Gropp and Heider, 2010; Frank and Goyal, 2009; Booth et al., 2001). The theories have suggested several variables as possible determinants of firm financing choice, including profitability, tangibility, liquidity, risk, size and age.

In a static trade-off framework, a firm chooses how much debt finance and how much equity to use by balancing the cost and benefits. In particular, the firms capital structure moves towards offsetting the cost of debt, that is the bankruptcy costs against the benefits of debt, that is tax advantages. Using the bankruptcy cost framework, variables such as tangibility, risk and size can be used as proxies (de Jong et al., 2008). With respect to tangibility, creditors in general demand more tangible asset in exchange for financing. Higher tangibility of assets means lower risk to creditors and reduce the cost of bankruptcy. Many empirical evidence report a significant positive relation between tangibility and firms ability to leverage (Gropp and Heider, 2010; Frank and Goyal, 2009; de Jong et al., 2008; Rajan and Zingales, 1995).

Given that MFIs are asscociated with high risk and information asymmetry problems, we expect tangible assets to mitigate contract problems, therefore, MFIs with more tangible assets can access more leverage. We also expect MFIs with high tangible assets to have a positive association with subsidies. As previous findings highlights a positive significant relation between tangibility and subsidies (Tchuigoua, 2015). This points out that donor agencies care about risk when they decide to fund MFIs.

When it comes to firm risk, many empirical literatures are not clear on its impact on firms capital structure. For example, Rajan and Zingales (1995) and Frank and Goyal (2009) find that risk is not an importnant determinants of firms capital structure. Unlike Lemmon et al. (2008) that report a significant negative correlation between firm risk and leverage. Similar results are reported in the banking industry where risk is found to significantly reduce leverage (Gropp and Heider, 2010). Moreover, the risk of default for MFIs can be importnant if the quality of their loan portfolio is bad. Outstanding loans portfolio represents a significant portion of MFIs assets. As a result, MFIs with high risk means higher volatility of earnings and higher probability of bankruptcy. According to Tchigoua (2015), the quality of MFIs loan portfolio provides information on the effectiveness of the devices for credit risk management implemented by the MFIs. Thus, we infer that MFIs with low portfolio risk are considered as less risky by creditors and donors. For this reason, we assume that leverage and subsidies are negatively associated with MFIs portfolio quality. We expect higher portfolio risk to have negative impact on both leverage and subsidies. However, MFIs that exhibit low portfolio risk might be more leverage and benefit more from subsidies.

In the information asymmetry or pecking order framework, firms generating profit will retain earnings inorder to avoid asymmetric information cost. The theory suggest that firms follow a specific hierarchy of financing by choosing internal financing followed by external financing. When the need for external financing arises, firms choose debt over equity. The rationale for this is that firm managers are better informed about their firms than ousiders and thus issue less equity when they feel the firm is undervalued. So in order to minimize asymmetric information cost, we expect profitable MFIs to prefer internal finance than external finance. Empirical results on the relationship between profitability and leverage seems to confirm the hypothesis that negative

relation exist between profitability and leverage (Rajan and Zingales, 1995; Booth et al., 2001; Fan et al.,2012; de Jong et al., 2008). In microfinance, Tchuigoua, (2014) find significant negative relationship between profitability and leverage. Profitable MFIs are thus expected to have lower leverage. In microfinance industry however, subsidised funding plays a vital role, we expect profitable MFIs to be negatively associated with subsidy. This relationship is meaningful given that it supports the profit incentive-view that profitable MFIs should rely less on subsidised funding such as grants and donations.

Following the pecking order framework, liquidity otherwise known as accumulated cash and other liquid assets serves as internal source of funds and will be used first to settle shor-term obligations and finance growth instead of debt. A firm holding a high proportion of its assets in liquid form is less exposed to sudden changes in its balance sheet (Nickell and Nicolitsas, 1999). High liquidity therefore reduces exposure to the risk of being unable to meet short-term financial commitments and the appetite for raising debt. Thus, we expect liquidity to have negative impact on MFIs leverage. de Jong et al (2008) finds high liquidity to be an importnant determinants of leverage in advanced economies. Subsidised funding may top the pecking order hierarchy since MFIs access such funds at no cost. However we cannot tell the direction of relationship beween liquidity and subsidies.

Size is expected to have positive impact on leverage. The most reasonable argument that explains such relationship is the bankruptcy costs (Rajan and Zingales, 1995). That is, large firms have low bankruptcy cost and in principle have more diversified potfolio with less probability of bankruptcy than smaller firms. Financial institutions spend more resources in monitoring small firms because they tend to have less information. Although majority of research on firms capital structure shows a positive association between size and leverage (Rajan and Zingales, 1995; de Jong et al., 2008),

this seems to be the case in the microfinance litereture (Bogan, 2012; Tchuigoua, 2014). In the case of subsidized funding, we expect a negative relationship between size and subsidies. The larger the MFI the less subsidies it attracts. The reason been that smaller MFIs are mostly the targets of donor agencies (CGAP, 2008). This argument is reinforced by Tchugoua (2014), which find a significant negative relatonship between MFI size and subsidies.

Existing research on the impact of MFI age on financing pattern is centered within the context of life cycle theory of MFI development (de Sousa-Shields, 2004; Bogan, 2012). Generally, the life cycle theory hypothesize that MFI sources of financing are linked to their stages of development. Subsidies such as grants and donations comprise the bulk of funding in the early formative stage of MFIs (Armendáriz de Aghion and Morduch, 2005). Debt funding becomes available as MFIs mature, while equity financing becomes available when MFIs are in their last stage of evolution (Fehr and Hishigsuren, 2004). With that in mind, we assume that mature MFIs to have postive relationship with leverage. As new or young MFIs are mostly the target of donor agencies for subsidized funding. Therefore we expect a negative relationship between mature MFIs and subsidies.

4.3. Institutional-specific factors and capital structure

The role of institutional environment has assumed an important dimension in the corporate finance literature (La Porta et al., 1997; 1998). Studies that compare capital structure differences in both developed and developing countries started to appear only during the last decade. For example, an early investigation of seven developed countries by Rajan and Zingales (1995) argued that although there is a uniqueness of firm specific factors that significantly influence the capital structure of firms across these countries, several institutional specific factors play an important

role in determining firm's capital structure. Similarly, Wald (1999) lend support the view that institutional features are significant determinants of capital structure.

We also have quite a number of empirical studies that focus mainly in analysing the effect of institutional factors on firm's capital structure in developing countries. Pioneers in this strand of study are, Demirguc-Kunt and Maksimovic (1996), who studied the impact of stock market development on corporate capital structure in thirty developing countries and concluded that the size of capital market significantly influences the use of long-term debt and acknowledge the importance of institutional factors in determining cross-country financing choice of firms. Similarly, Booth et al. (2001) examined capital structure of firms in ten developing countries and found the need to study the influence of institutional factors on capital structure in developing countries. However, they find that institutional factors such as GDP growth and capital market development affects leverage differently.

Furthermore, some studies take a comparative view on the effect of institutional factors in both developed and developing countries. Study in this regard by Demirguc-Kunt and Maksimovic (1999) compared the capital structure of firms in 19 developed countries and 11 developing countries. They find that institutional differences between developed and developing countries explain a large portion of the variation in the use of long-term debt. They also observe that some institutional factors in developing countries influence the leverage of large and small firms directly. In addition, Fan et al. (2012) analyse a larger sample of 39 developed and developing countries. They find a significant impact of a few additional institutional factors such as degree of development in banking sector, and equity and bond markets. In the same line of reasoning, Antoniou et al. (2008) concluded that capitals structure choice of firms depends on the surrounding

economic environment such as economic condition, existence of stock market as well as the size of the banking sector.

However, Giannetti (2003) argues that the difficulty to establish a significant relationship between most institutional variables and leverage is due to sample selection bias induced in many previous studies that include only large listed firms. Using a large sample of unlisted firms, Giannetti (2003) examines how firm and institutional characteristics affect corporate financing decisions and found that leverage is significantly related to stock market development, creditor protection and legal enforcement. Similarly, Hall et al (2004) examines a large sample of unlisted firms from eight European countries and found a cross-country variation in the determinants of capital structure that is due to institutional differences.

Nevertheless, the literatures reviewed above specifically examine the direct impact of institutional factors on firm's capital structure and they converge on the idea that firm financing decision are affected by the same variables in both developing and developed countries. They show that better institutional environment has positive impact on firm's capital structure. This seems to be the case in the microfinance sector, as Tchuigoua (2014) argued that microfinance sector and formal banking sector are complimentary. The literature on country-specific factors and MFIs capital structure is still in its infant stage. Existing literature on the impact of institutional factors on microfinance institutions looked at three broad areas in analysing the outcome of MFIs.

The first category looked at the effect of macro institutional factors on MFIs performance model. One major study in this line of research was by McGuire and Conroy (1998) who examined microfinance financial performance and the macroeconomic conditions using a survey data that observe the effect of the Asian financial crisis on MFIs. They examine the percentage changes in

loans, savings, total assets, and capital stocks of MFIs from 1996 to 1998. They found that MFIs were able to maintain relatively strong financial success during the Asian financial crisis. Furthermore, Ahlin et al (2011, 2006) investigates how MFIs performance depends on macro-institutional outcome. They merge institutional-level data with MFI-level data of 373 MFIs. They found that performance measured by operational self-sufficiency and loan portfolio growth to be significantly and positively affected by the macroeconomic and institutional environment in which an MFI is situated.

The second line of research that has received much attention in the literature is the relationship between institutional environment and poverty. Recent study by Imai et al (2012) tested the hypothesis that microfinance reduces poverty at the macro-level using a cross-country data for 2007 and a panel data for 2003 and 2007. Their econometric results confirm that microfinance loans per capita are significantly and negatively associated with poverty, that is, a country with higher MFI gross loan portfolio per capita tends to have lower poverty. There are however, literatures that try to establish a reverse proposition in which microfinance drives institutional factors (Levine, 2005). This is much less believable that microfinance drives economic growth in the short run (Ahlin and Jiang, 2005).

The third category of research deals with the impact of institutional factors on MFIs funding choices. Tchuigoua (2014) conducted a pioneering work in this area. The study addresses the question of whether institutional features matter in the capital structure of MFIs using a sample of 292 MFIs between 2004 and 2009. Findings suggest that country's legal tradition, creditor's right and the level of financial development are significantly related to MFIs capital structure. However, most of these studies suffer from erroneous assumptions, weak results and more importantly some econometric problems.

In the analysis of institutional-specific determinants of MFIs capital structure, we utilize an alternative regression framework where we use to determine the indirect impact of institutional factors on MFIs capital structure. Studies examining the indirect impact of institutional factors on firm's capital structure have started to appear recently. de Jong et al., (2008) were first to examine and argue on the premise that institutional factors have direct and indirect effect on firm's capital structure. Although they agree with the conventional direct impact of country-specific factors on capital structure of firms, they as well show that there is an indirect impact of institutional factors as these factors influence the role of firms-specific determinants of capital structure. Furthermore, Gungoraydinoglu and Oztekin, (2011) analyse the determinants of capital structure across 37 countries. They find a 22% variation in leverage due to the direct impact of institutional factors. An indirect impact of institutional factors explains 12% variation in leverage through the effect of firm specific factors.

In this study, we follow de Jong et al., (2008) approach in testing for the direct and indirect impact of institutional factors on MFIs capital structure. Their methodology is sequential, starting by testing the firm-specific determinants across countries, followed by testing the equality of coefficients across countries. They use weighted least square regression model where a single average capital structure for each country is used as an observation to determine the direct and indirect impact of institutional factors on firm's leverage. This studies without altering the model will provide us with a more reliable estimate that determines the impact of both firm-specific and institutional factors on MFIs capital structure decision.

4.3.1. Institutional-specific factors and Information asymmetry

The role of information asymmetry in a firms financing decision can be traced back to the work of Myers and Majluf (1984). Information asymmetry problem between firm insiders and outside

investors creates conflict of interest and can therefore determine firm's choice of capital. Corporate finance literatures suggest that the optimal capital structure of firms depends on the information available to investors and the investor's ability to monitor and enforce compliance through institutions (Demirguc-Kunt and Maksimovic, 1999; Booth et al., 2001; Antoniou et al., 2008; Li and Ferreira, 2011; Fan et al., 2012). For example, strong legal enforcement can reduce information asymmetry problems and mitigate agency conflicts (La Porta et al, 1998).

Prior empirical studies on the impact of institutional factors on firm capital structure converges on the idea that firms operating in countries with strong and better institutional environment may have easy access to finance on attractive terms (Demirguc-Kunt and Maksimovic, 1999; de Jong et al., 2008; Li and Ferreira, 2011; Gao and Zhu, 2015). These studies argue on the basis that a strong institutional environment can reduce information asymmetry between firms and investors and consequently affect firms financing decision. This seems to be the case in the microfinance sector. As Garmaise and Natividad (2010) argue that, information asymmetry seems to contribute to the rising cost of capital in developing and less developed markets where MFIs operate. In countries with weaker institutions, information asymmetry problems will make it difficult and expensive for MFIs to raise capital and may even hinder their growth and development (Garmaise and Natividad, 2010).

The most recent empirical approach on information asymmetries that deals with microfinance funding is the work of Garmaise and Natividad (2010) that measures plausible exogenous shock to MFI information environment. Asymmetric Information was found to have negative effect on MFI cost of financing and its impact on supply of capital is mixed. Similarly, Tang (2009) show that firms with decreasing information asymmetry, experience additional decrease in borrowing cost and increase in capital supply. Moreover, the effect of information asymmetry can be found

on other non-commercial source of funding to MFI. Gosh and Tassel (2013) model predicts the quantity of capital supplied by donors under asymmetric information determines the choice of charging interest rate or not. Non-commercial funders of MFI face the dilemma of issuing funding as grant or grant based.

Tchuigoua (2014) was the first to study institutional framework and MFI funding policy using the asymmetric information assumptions. The study finds that better institutions environment such as creditor's right, country's legal tradition and the level of financial sector development reduces information asymmetry in MFIs credit market and consequently affects MFI level of external finance. Thus, there is a consensus for the presence of information asymmetry in MFI credit market as discussed earlier. There is as well empirical evidence on the effect of institutional environment on MFI funding policies. Therefore, our study assumes that better institutional factors can overcome information asymmetry and consequently affect the capital structure of MFIs.

The novelty of this work is that, apart from analysing direct impact of institutional factors, we looked at the indirect impact of institutional factors on MFIs capital structure as in de Jong et al (2008) and Gungoraydinoglu and Oztekin (2011). We specifically argue that the capital structure of MFIs is directly and indirectly determined by institutional-specific factors. For example, de Jong et al (2008) find that with better creditor's right and contract enforcement, the effect of tangibility or MFI size are diminished as the institutional structure provides protection for both parties in a contract. In this case, the relevant institutional-specific factors that could possibly explain the direct and indirect impact on MFI capital structure under the information asymmetry framework were selected from the literature.

4.3.1.1. Direct impact of institutional factors on MFIs capital structure

Direct impact means institutional-specific factors directly influence MFIs capital structure. For example, several studies on firm financing decisions have shown strong evidence that the degree of creditor's right plays an important role in financial contracts. Early study by Aghion and Bolton (1992) used theories based on transaction cost and contractual incompleteness. They find that firm's choice of capital structure is explained by the strength of control rights attached to either debt or equity. This finding suggests that lenders should enjoy from bargaining power that would allow them to seize collateral or takeover borrower's firms in the event of default. Therefore, countries with strong creditor's right that allows lenders to seize borrower's collateral or take control of their firms in order to force repayment may assist firms in that country to get financing on favourable terms.

A study by Giannetti (2003) using a sample of unlisted firms found that strengthening creditors right to be associated with leverage. Similarly, Gonzalez and Gonzalez (2008) show that strong creditor's right reduces agency cost of debt, making it difficult for firms to access financing in countries with weak creditors right. Hence, firms resort to internal funding than costly external finance. Qian and Strahan (2007) show that countries with strong creditor's rights encourage banks to charge lower interest rate, thereby making credit available. Thus, availability of cheap credit means more leverage to firms. However, Rajan and Zingales, (1995) argue that strict enforcement of creditor's right may be associated with lower leverage for firms. Consistent with this view, de Jong et al., (2008) find a significant negative relationship between creditor's right protection and leverage level of firms. The possible explanation for this is that higher creditor's right makes debt riskier because managers fear losing their jobs or where creditor's right involves forceful bankruptcy in times of distress.

Variation in creditor's right matters a great deal, on how loan are structured and priced. This relationship is put to test by Bae and Goyal, (2009), they show that variation in countries creditors right seems to reduce loan spreads, but do not matter for loan size and maturity. Advocates of strong creditor's right protection claim that if the right to repossess collateral is not strictly protected, the use of collateral to solve information asymmetry will be lost. This can lead to underinvestment and credit rationing in the economy. Therefore, creditor's right to seize collateral can help reduce problems that arise when information asymmetries between borrower and investor are present.

Thus, we expect MFI capital structure to matter in countries where creditor's right is well protected. As expected Tchuigoua (2014) find a significant positive relationship between strength of creditor's right with both external debt and donated equity in the Microfinance sector. Better creditor's protection seems to reduce information asymmetry and consequently attracts more external financing in the form of debt or subsidies.

Another important institutional-specific factor that may affect the capital structure of MFIs is credit information bureau. Credit information bureau or credit registry, which provides a numerical ranking of borrower credit quality have become a central part of the credit decision used in a growing number of credit markets. Micro businesses credit market is perhaps one of the segments of credit market where problems of asymmetric information are most pronounced. Independent third party analysis such as rating agencies or stock prices of most small businesses like Microfinance institutions are usually not available. They are also very diverse, which makes it difficult to identify clear predictors of success. These problems are greater in developing countries due to poor accounting standards and frequent economic volatility.

Recent research in the development of credit markets across countries shows that institutions facilitating sharing of credit information (such as public and private credit registries) foster the growth of private credit markets (Jappelli and Pagano, 2002). Djankov, McLiesh and Shleifer (2007) find that higher levels of information sharing among creditors and stronger creditor rights are associated with a larger private credit market relative to gross domestic product. The analysis suggests that credit registry benefit private credit markets in developing countries with weaker legal systems. In other words, both ex ante better information for creditors and ex post stronger creditor rights contribute to credit market expansion.

Kallberg and Udell (2003) use data from Dun and Bradstreet (D&B) to evaluate whether credit registries containing firm-level data are important predictors of firm's loan quality. They find that the credit information produced by D&B has substantially greater predictive power than the data contained in financial statements. They find that exchange generated information provides significant explanatory power in failure prediction models. Their study compliment study by Jappelli and Pagano (2002), who find in cross-country macro level test that credit information bureau, adds value to credit markets.

Previous theoretical and empirical studies provide strong evidence that credit registry reduce information asymmetry in the credit market. For instance, Sorge and Zang (2010) find that higher levels of information sharing (as proxied by the existence and coverage of private and public credit registries as well as the depth of credit information) are associated with a higher share of long-term debt as a proportion of total corporate debt in both developed and developing countries. Ex-ante better credit information acts as a substitute for ex-post stronger creditor's protection in the credit market. It reduces both the risk of moral hazard and adverse selection in the credit market. Microfinance institutions existing in countries with efficient credit registry may tend to attract

more debt compared to those with weak credit information bureau. Therefore, our key prediction is that the presence of credit information bureau in a country reduces information asymmetry between borrowers and lenders, which has a larger impact on MFIs capital structure.

The financial sector development of a country expressed as the domestic credit provided by private sector as a percentage of GDP can also be a key institutional-specific variable. Numerous studies document the importance of financial sector development on firms financing choices (Demirgüç-Kunt and Maksimovic, 1999; Booth et al., 2001; Giannetti, 2003; Antoniou et al., 2008; Beck, Demirgüç-Kunt, and Maksimovic, 2008). In the banking literature, Diamond, (1984) suggest that banks overcome information asymmetry by investigating borrower worthiness and use the information gathered to allocate capital. Since the banking sector uses information to monitor borrowers, the development of the sector means firms can have easy access to external finance. For instance, Gianetti (2003), find that firms have more leverage in countries with developed financial sector. However, Fan et al., (2012) find no significant relationship between the level of financial sectors development and firms leverage, which is measured by the ratio of total deposits over the GDP of a country.

Studies on the effect of financial sector development on MFIs started appearing recently. Vanroose and D'Espallier (2013) note that MFIs are affected by the level of banking sector development. They investigate the substitutability of microfinance sector and commercial banking sector. They find that MFIs succeeds where commercial banking sector fails. Similarly, Tchuigoua (2014) find that financial sector development increases MFIs level of borrowings. The study concludes that microfinance sector and the conventional banking sector are complimentary. In line with this argument, we assume that developed financial sector enables MFIs to access commercial funding

and reduces their dependence on subsidized funding. Since MFIs are usually small and non-listed, we can assume that financial sector development can affect MFIs capital structure decision.

Differences in legal system might help explain why firms are financed differently across countries (Demirgüc¸ -Kunt and Maksimovic, 1996, 1998; La Porta et al., 1997, 1998). A variety of papers have analysed the adoption of different legal systems and their impact on capital structure. La Porta et al., (1997, 1998) show that differences in legal system plays an important role in capital market development, simply because it affects the accounting standards and legal protection of investors in a country. They specify that common-law countries have good accounting standards and stronger investor protection. Similarly, Demirgüc-Kunt and Levine (2001), show that common-law system creates incentives for market-based system that can easily create wealth. However, civil-law system tends to have underdeveloped financial systems.

Similarly, using a partial adjustment model, Oztekin and Flannery (2012) show that firms in common-law countries adjust to optimal capital structure faster than firms situated in civil-law countries. However, Fan et al (2012) find that firms operating under common-law system are associated with lower debt ratios. This is not the case in the microfinance sector, as Tchuigoua (2014) finds that MFI in common-law countries are more leveraged. They also find that a countries legal origin is not associated with donated equity. This is expected, as there are no legal binding contracts in such type of funding. It is established that common law countries are more business friendly, have transparent laws and encourage disclosure (La Porta et al., 1998). We expect firms in such countries have low information asymmetry problem and can access funding external sources on favourable terms. Therefore, we assume MFIs to have positive relationship with leverage in common law countries. However, since subsidies are not legal binding instruments, we cannot assume the direction of our relationship.

Several empirical studies provide strong evidence that a country's level of corruption determines firms capital structure. Alves and Ferreira (2011) and Fan et al. (2012) show that countries level of corruption explains firms capital structure. Fan et al (2012), report that firms in countries with high level of corruption are less likely to raise equity. This is because it is easier to expropriate outside equity holders than debt-holders. Similarly, Alves and Francisco (2015) find that firms issue more debt and less equity in countries with high level of corruption because there is high level of information asymmetry between firms and investors, damaging the issuance of riskier assets.

It is expected that corruption may have effect on microfinance institutions simply because MFIs are relatively small and non-listed. Corruption taxes their operations and creates barriers to their expansion. It may make it easier for MFIs to avoid regulations or push them out of the formal credit market (Ahlin et al., 2011). In view of that, Tchuigoua (2014) find significant relationship between level of corruption and MFIs funding policies. They show that in countries with high level of corruption, subsidies from donor agencies decreases. We expect that leverage and the amount of subsidies will be more important in MFIs that operate in countries with high level of corruption.

Other important institutional-specific variables that are studied in many capital structure literatures include country's political stability, Regulatory framework and gross domestic product growth rate. Since majority of MFIs in our sample are based in developing or emerging economies, there is a need to capture the effect of political instability because it contributes to the uncertainty of returns to investors or in the other way round, it may contribute to increase in subsidies to unstable countries. We expect politically stable countries to attract more leverage and less of subsidies. Regulatory framework is another important control variable. Countries with regulatory framework that controls the activity of MFIs may tend to attract more leverage and less of subsidies. This is

consistent with the findings of Tchuigoua (2014). Furthermore, GDP growth rate is included in our analysis as a control variable to capture the effect of economy wide growth. Higher GDP growth rate in a country implies more option for future growth for all firms in an economy. Booth et al., (2001) suggest that firms are more likely to borrow against real option for growth, hence leverage tend to rise with GDP growth.

4.3.1.2. Indirect impact of institutional factors on MFIs capital structure

We argue that institutional-specific factors do not only impact MFIs capital structure directly but also indirectly. This suggests that the institutional-specific variables influence the way in which firm-specific factors determine firms capital structure. To achieve this, we group our firm-specific variables in two theoretical perspectives as described above. The first group is the bankruptcy cost variables that include tangibility, risk and size, and the second is the pecking-order variables, namely profitability and liquidity. The study expects indirect impact relationship across four institutional variables other than the control variables.

Considering the bankruptcy cost variables, namely tangibility, risk and size, it is expected that with better creditors right and good legal origin, bankruptcy cost can be mitigated because these structures provides protection for both the creditors and borrowers. For instance, creditor's rights help promote the development of credit market by reducing business risk and forcing borrowers to abide by their contracts, thereby making tangibility and size factors relatively less important in the credit market. Using similar assumption, de Jong et al. (2008) observe that country's legal system of enforcement indirectly influences firm's capital structure. They find a negative relationship between contract enforcement and firm size coefficients. This indicates that better enforcement reduces the relative importance of firm size on firm's access to leverage.

The study therefore expects a negative indirect relationship between the following institutional-specific variables (Creditor's right and Legal Origin) and leverage via the set of firm-specific coefficients (tangibility, risk and MFI size). With respect to the indirect effect of creditors and legal origin on MFIs subsidies via firm-specific factors, we expect no relationship since subsidies such as donated equity are not legal binding instrument that can be accessed in the credit market.

Institutional specific variables can have an indirect effect on pecking order financing variables namely, profitability and liquidity. It is expected that credit information bureau has an impact in mitigating the role of pecking order financing variables because higher level of information sharing among creditors are associated with a larger private credit market, and less asymmetric information problems (Djankov, McLiesh and Shleifer, 2007; Sorge and Zhang, 2010) which can facilitate MFIs access to external finance irrespective of the level of profitability or liquidity. With less level of asymmetric information problem in the credit market, high profitability and liquidity is relatively less important and further increase the use of debt.

To capture this relationship better, this study assumes that debt is used as disciplinary mechanism in order to force MFI managers to pay out profits or advance loans that can generate returns, rather than engage in empire-building activities as described by (Jensen, 1986). With respect to the impact of credit information bureau on MFIs subsidies via pecking order variables (Profitability and liquidity), we expect no relationship because subsidy as a financial instrument is not covered in credit information registries. The role of pecking order variables cannot be inferred in this case.

Finally, considering the bankruptcy cost variables, namely tangibility, risk and size, it is expected that when financial sector is further developed, the risk of bankruptcy cost can be mitigated because the need for these variables (tangibility, risk and size) is greatly reduced in a well-

developed financial sector. Thus, the study assumes a negative indirect impact of financial sector development variable on leverage via a set of bankruptcy cost variables (tangibility, risk and size). In the case of subsidies, we expect that the role of bankruptcy cost variables is mitigated because with more available external financing, MFIs are less dependent on subsidies. When financial sector is well developed, bankruptcy cost variables are less an issue.

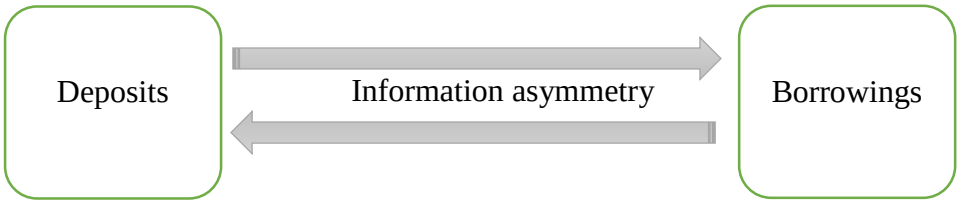
4.4. The joint determinants of the use of deposits and borrowings

4.4.1. Conceptual Framework of the use of deposits and borrowings

The extent of MFIs borrowings has been argued as relatively dependent on the financial environment in the countries themselves. For instance, it is observed that Eastern Europe, Central Asia and Latin American financial markets are characterised by relatively more conducive environment in promoting debt financing, whereas in Africa, the debt market is far less conducive (Galema et al., 2011; CGAP, 2011). However, in the absence of a conducive financial environment for either deposits or borrowings, one can expect that they could be an environment where MFIs are more likely to use deposits and borrowings together. Therefore, it can be conjectured that there will be an interplay in the decision by MFIs to either undertake borrowing or mobilize deposits.

Prior studies on MFIs capital structure treat deposits and borrowings independently (Bogan, 2012; Tchuigoua, 2014), i.e., the decision to mobilize deposits is independent of the decision to borrow by MFIs. This Chapter, covers the empirical relationship between deposits and borrowings to the extent whether they are substitutes or complement. Figure 4.2 depicts how the substitutability or complementarity relationships between deposits and borrowings vary across different institutional environment. In this case, it is argued on whether MFIs are more likely to displace borrowing with deposits and vice-versa using the asymmetric information framework.

Figure 4.2: Conceptual Framework of deposits-borrowings relationship



4.3.1. Deposits-borrowing substitutability theory

According to CGAP (2010), deposits (for deposit taking MFIs) are similar to borrowing in terms of claims and security, except for a few minor differences. Deposits often have shorter maturities than borrowings and adjust to current market rates faster than borrowings. In practice, both deposits and borrowings are usually quite stable source of funding, with long holding periods and frequent rollovers (Earne and Sherk, 2013). However, it is puzzling that the use of deposits has been largely ignored in MFIs decision to borrow and vice-versa. Prior studies of microfinance institutions implicitly assume that the decision to mobilize deposits is independent of the decision to borrow by MFIs (Bogan, 2010; Tchuigoua, 2014). This assumption seems implausible, given the similarity of commitments between deposits and borrowing. It can be assumed that an increase in deposits would require less use of borrowings and vice-versa.

Similarly, factors affecting MFIs willingness to substitute deposits and borrowing financing are familiar enough at the qualitative level, but the actually prevailing deposits-borrowing substitutability and its consequences for important issues of economic behaviour remains question that can only be resolved empirically. It is simply not possible, based on priori considerations alone, to say which financing sources or other factors are foremost to MFIs under any economic condition or institutional environment. Myers and Majluf (1984) suggest that the cost of finance

may be high if the firm suffers from asymmetric information problem. Although the influence of information asymmetry on firm's capital structure is well documented. Few papers study how the change from deposits to borrowings are related to information asymmetry. Here I argue that in an institutional environment with high asymmetric information, the marginal cost of borrowings will be affected to a larger degree by an extra amount of fixed claim obligations. A firm would therefore, substitute borrowings to deposits which has lower cost.

The intuition is as follows, consider a MFI that plans to finance its operation with borrowing from the capital market. If there is a greater degree of information asymmetry in the market towards MFIs, investors would be more concerned about the MFIs increased risk of financial bankruptcy associated with fixed claim obligations. As a result, the risk premium demanded by the market will increase more rapidly when the MFIs borrows more new funds. To this end, we argue on the premise that MFIs tend to borrow when the institutional environment (creditor's right, credit information index and financial sector development) is conducive (less information asymmetry in the market) and thereafter substitute to deposits financing when institutional environment is no longer favourable, that is, high information asymmetry in the credit market.

4.3.2. Empirical evidence

Some of the empirical work on financial asset substitutability has received much debate since 1970's. Most of the studies investigating the substitutability of firm financing choices concentrate on debt-lease financing framework. While some early studies find complementary relationship between lease and debts (Bowman, 1980; Ang and Peterson, 1984). Others find strong empirical evidence against the complementarity relationship between lease and debts (Beattie et al., 2000; Yan, 2006; Minhat and Dzolkarnaini, 2016). Similarly, Friedman (1985) and Aivazian et al., (1990) report a substitutability relationship between long-term debts and equity.

On the impact of institutional environment on corporate liabilities, different types of substitutability relationship become more important. Almeida and Masetti (2014) examine the corporate debt substitution during the financial crisis using a novel firm-level dataset on syndicated loan and bond issuances by listed non-financial firms in the euro zone area between 2003 and 2013. They show that firms are more likely to issue bond instead of a loan at times of bank credit supply contractions.

Similarly, Becker and Ivashina (2014) find strong evidence of firms switching from bank loans to bonds at times that are characterized by tight lending standards, depressed aggregate lending, poor bank performance, and tight monetary policy. They show that this substitution behaviour has strong predictive power for bank borrowing and investments by small firms. However, the varying findings from these studies show that substitutability relationship is an unresolved puzzle in the finance literature, especially when it involves different class of financial instruments or certain specialised sector of the economy such as the microfinance sector.

The reduced focus on deposits and borrowing in the microfinance literature could be explained by the nature financial firms such as banks capital structure. Banks capital structure fundamentally differs from the one of non-financial firms since it includes deposits, a source of financing generally not available to firm. Gropp and Heider (2010) investigate the capital structure of large US and European banks during 1991 to 2004. They show that banks have substituted non-deposit borrowings for deposits during their sample period. The share of non-deposit liabilities in total book assets increases from around 20% in the early 90s to 29% in 2004. The share of deposits declines correspondingly from 73% in the early 90s to 64% in 2004. They find that whenever an estimated coefficient is significant, it has the opposite sign for deposits and for non-deposit liabilities.

Similarly, Tchuigoua (2014) studied the impact of institutional factors on deposits and borrowing independently. Findings show that the coefficient of each institutional variable for both deposits and borrowings are in the opposite direction. This can be assumed to be a case of partial substitute, where the use of one financing choices displaces the other. However, this assumption is not yet subject to empirical estimation. Hence, this study intends to investigate the relationship between deposits and borrowings.

4.4. Research question

In light of the above discussions on the empirical literature review on how institutional-specific factors affect MFIs capital structure and its impact on the joint determinants of MFIs capital structure. The data analysis and discussions of the findings in chapter 7 and 8 were focused to answer the following research questions as introduced in chapter 1.

1) Do the standard firm-specific determinants affect MFIs capital structure? Is the impact of firm-specific determinants equal across countries?
2) Do institutional-specific determinants have significant direct influence on MFIs capital structure (Leverage and Subsidies)?
3) Do institutional-specific determinants have significant indirect influence on MFIs capital structure (Leverage and Subsidies)?
4) What is the empirical relationship between deposits and borrowings? Are they substitute or complements?
5) Does the substitutability or complementarity relationship vary across institutional settings?

4.5. Evaluation, critique and gaps in the existing literature

Previous studies on firm capital structure has established the competing determinants of firm capital structure, that is, firm-specific determinants and institutional-specific determinants. In the firm specific determinants, recent studies have focused in analysing the relationship between corporate governance mechanisms such as board of directors and firm capital structure. However, the directors in most studies are treated as a homogenous group without controlling for personal characteristics such as gender. Variations in these characteristics, and gender in particular, may be able to explain the difference financing choices among firms (Alves et al., 2015; Campbell and Vera, 2010).

Most of the research in the area of gender diversity on boards of directors focuses on profitability and, so far, there is no consensus in the literature on the relationship between female board representation and performance. Some studies find that board diversity leads to better performance while others find no such relationship (e.g., Carter et al., 2003; Huang and Kisgen, 2013; Gregory-Smith et al., 2014; Gulamhussen and Santa, 2015; Sila et al., 2016). Another strand of the literature looks at the determinants of boards appointing female directors. Firm risk is found to be one of the determinants of female board appointments. Adams and Ferreira (2004) find that firms with more volatile stock returns tend to have fewer female directors on their board. The authors explain these results with reference to Kanter's (1977) argument that group homogeneity (i.e., a male-dominated board) is essential in environments where uncertainty is high.

Similarly, Farrell and Hersch (2005) find that the probability of female director appointments is higher in less risky and better performing firms. The authors argue that female directors self-select into these firms due to demand for gender diversity. Farrell and Hersch (2005) also find that female directors are more likely to be appointed to boards with fewer female directors or to replace female

directors on the board. Gregory-Smith et al. (2014) find similar results for UK firms. However, they cannot establish a relation between firm capital structure and the gender of directors being appointed. Overall, the results of both Farrell and Hersch (2005) and Gregory-Smith et al. (2014) confirm that neither a director's gender nor the proportion of female directors on the board are exogenous random variables, and that reverse causality is likely to be an issue when investigating the impact of gender diversity of non-financial firms.

Not only are the findings in sectors other than the microfinance sector inconclusive, Adam and Mehran, (2003) argue that financial firms differ from non-financial firms, and that the conclusion drawn for other sectors cannot be generalized for financial firms such as MFIs. Unlike non-financial firms, microfinance institutions nature of regulation, manner in which revenues are generated and risk management objectives generates novel challenges for corporate governance that justify focused attention (Strom et al., 2014; Mersland and Strom, 2009). Using the microfinance experience, we try to examine the effect of female directors on MFIs capital structure.

In the microfinance sector, results tend to show positive relationship between female directors and financial performance (Strom et al., 2014; Mersland and Strom, 2009). However, these studies are restricted to MFIs performance model. Little is known about the influence of female directors on MFIs capital structure. In fact, Tchuigoua (2014), investigates MFIs capital structure mix from an institutional perspective, but fail to cover the governance perspective. The study has highlighted that MFIs source their funding from various channels such as deposits, borrowings, equities and subsidies. This is where the role of female directors could have been very pertinent in attracting a

particular type of funding[3]. Female directors on board could therefore be important determinants of MFI capital structure. To our knowledge, there is no study that links board gender diversity to capital structure in the microfinance sector.

Research on the institutional-specific determinants of MFIs capital structure across countries points to an important role factors such as creditor's right and financial sector development in influencing MFIs capital structure (Tchuigoua, 2014, 2015; Bogan, 2012). Although this research has identified several empirical regularities, it suffers from erroneous assumptions, weak results and more importantly some econometric problems. For instance, study by Tchuigoua (2014) used a cross-country MFIs data from 66 countries and find that institutional factors affect MFIs capital structure. However, this study implicitly assumes that the impact of firm-specific factors on MFIs capital structure are the same across countries as observed in many previous non-MFI capital structure studies (Booth et al., 2001; Giannetti, 2003; Fan et al., 2012). The procedure of pooling firms from different countries into single regression model that contains both firm-specific and institutional-specific variables while the assuming that there are no differences across country. With a large number of observations, this process is more likely to produce a statistically significant result for most of their institutional-specific variables.

As an additional contribution to the paper by Tchuigoua (2014), we go a step further by decomposing our analysis into stages. In the first, we start by analysing the impact of firm-specific factors on MFIs capital structure on a country-by-country basis. Several empirical studies on non-MFIs have reported the estimated coefficients for firm-specific determinants of capital structure per country and have acknowledge the fact that firm-level determinants on capital structure does

[3] An anecdotal evidence suggest that female directors are instruments through which investors, donor agencies and other capital providers ensure that their funds are channelled to the right purpose (Hartarska, 2005).

differ in terms of signs, magnitude and significance levels across countries (Booth et al., 2001; Gianetti, 2003; Fan et al., 2012). Most recently, de Jong et al., (2008), find that firm-level determinants of leverage do differ across countries. We build on this implicit assumption to show whether the impact of firm-specific factors on capital structure of MFIs does differ across countries.

Furthermore, the link between deposits and borrowing decision has not been investigated in the past. The joint determinants of deposit and borrowings is examined owing to the fact that they are examined independently in previous microfinance literatures (Tchuigoua, 2014; Bogan, 2012). While empirical studies on substitutability of financial asset employ the least squares method to analyse data (Mehran et al., 1999), a recent US study by Yan (2006) uses generalised method of moments (GMM) technique. With this method in place, a re-examination of Tchuigoua (2014) in presenting the microfinance evidence on the extent of deposit-borrowing substitutability relationship is warranted.

4.6. Summary

Based on the theoretical framework reviewed in chapter 2, this chapter presents a comprehensive literature review on the impact of institutional-specific determinants on MFI capital structure, including specific discussion on the direct and indirect impact of institutional-specific determinants. Detailed discussion on the joint determinants of MFI capital structure and the extent to which these financing choices (deposits and borrowings) are substitute or complement is presented. In the next chapter we present the research methodology used in this study.

Chapter 5 - Research methodology and data

5.0. Introduction

This chapter presents the basic research design and methodology used in conducting the research. It starts by summarizing the key research focus and justifying the reason for choosing the empirical research method in carrying out the study. Next, Section 5.2 discusses the methodologies used in previous studies. Section 5.3 shows the method techniques used in this study. Research design is discussed in section 5.4. The sample selection procedure is discussed in Section 5.5. Section 5.6 presents the conceptual model. The empirical research method employed to analyse the data. The models, assumptions and rationales behind the selected techniques are explained in section 5.7. Section 5.8 describes the variable definitions and measurements. The rationales behind the choice are explained. The final section concludes this chapter.

5.1. Research focus

The focus of the research is to investigate the determinants of microfinance institutions capital structure around the world using a comprehensive measure of capital structure, and recognising the link between deposits and borrowings financing. The factors being examined are of the firm-specific and institutional-specific factors that have been tested in many prior capital structure studies. Despite such vast amount of literature, empirically testing the theoretical propositions on lending institutions such as microfinance has proved challenging, with evidence documented so far not clear. As Myers (1984) once pointed out that “we know very little about capital structure” (p.575). While in recent years, significant progress has been made in understanding the determinants of corporate capital structure, our understanding remains incomplete particularly in respect of lending institutions such as microfinance institutions.

5.2. Methodologies used in previous studies

Several empirical studies have attempted to assess the determinants of firm's capital structure. All studies in the reviewed literature used quantitative data analysis to investigate the firm-level such as board gender diversity and institutional level determinants on capital structure. For example, Campbell and Vera (2010) conducted a study on quoted Spanish firms using GMM models with 408 observations. This study however, was biased because it examined only firms listed in the Spanish stock exchange. The capital structure definition is limited (market value of stock and the book value of debt divided by the book value of total assets). The number of observations was also too small to achieve statistically reliable conclusions and, therefore, generalizability is questionable. Huang and Kisgen (2013) examine corporate financial and investment decision made by female executive compared with male executives using the difference-in-differences framework to control for endogeneity. Although this method is intended to mitigate the effect of extraneous factors and selection bias, it may still be subject to biases such as reverse causality and omitted variable bias.

Alvez et al., (2015) studied the composition of board of directors and capital structure of non-financial firms from 33 countries. The methodological weakness of this study is that, they assume that board gender diversity and financing sources variables are unlikely to be endogenously determined which is against prior evidences suggesting that capital structure shocks cause changes in governance mechanisms in microfinance sector (Strom et al., 2014). Moreover, conclusions drawn from non-financial firms cannot be generalized to financial firms. Unlike non-financial firms, financial firms call for distinctive regulatory treatment and this generates novel challenges for corporate governance (Gulanhussen and Santa, 2015).

Mersland and Urgeghe (2013), examined the determinants of MFI financing using data from 319 MFIs in 68 developing countries. The dataset has a certain sample selection bias as only rated MFIs are included. This study used simple pooled probit regression in which the coefficient of the explicative variables cannot be interpreted as marginal effects on the dependent variable, and their signs only show whether the corresponding variables influences the likelihood for the dependent variable to equal 1. However, binary outcome variable does not contain any direct information a non-constant variance. For example, the variance of capital structure is tied directly to the probability of board composition. This implies that any inference about changes in this variable must come from observed changes in the probability of a board composition.

The study by Adams and Ferreira (2009) was set to explain the significant impact of female directors on firm outcomes. Specifically, the study was meant to show how female directors improve governance quality and firm performance. Their study was built on many previous works Farrell and Hersch (2005) which fail to address the endogeneity problems that arise because of differences in unobservable characteristics across firms or reverse causality. Instead of a single method analysis, they introduced comprehensive analysis of the consequences of gender diversity of boards. Their study was based on data obtained mainly from Investor Responsibility Research Centre which does not cover microfinance institutions.

Mersland and Strom (2009) and Strom et al., (2014), have used multiple regression models with a relatively moderate sample compared to previous studies. Using self-constructed global dataset of MFIs collected from third party rating agencies, Mersland and Strom (2009) employ random effect panel data estimation without consideration for endogeneity issues. Following this trend, Strom et al (2014) expand the gender diversity variables to three female leadership categories. This study used Heckman endogenous dummy variable model to control for any possible endogeneity

problem. This study however, focused only on the effect of board gender diversity on governance and performance. Thus, the role of female directors on MFIs capital structure is not covered in this study.

On the impact of institutional specific factors on capital structure, prior studies by (Booth et al., 2001; Giannetti, 2003; Fan et al., 2012) use simple multivariate analysis for cross-section of firms in different countries and sectors excluding MFIs. Although this research has identified several empirical regularities, it suffers from erroneous assumptions, weak results and more importantly some econometric problems. By reporting the estimated coefficients for firm-level determinants of leverage per country, these studies, on the one hand, acknowledge that the impact of firm-level determinants does differ in terms of significance levels across countries. On the other hand, in the analysis of institutional-specific determinants of corporate leverage, these studies also make use of country dummies in pooled firm-year regressions, thus forcing the firm-specific coefficients to have the same value. With an extremely large number of firm-year observations, it is more likely for this procedure to produce statistically significant results for many country-specific variables. However, de Jong et al., (2008) utilizes an alternative regression framework where a single average capital structure for each country is used as an observation, they hardly find strong evidence on this issue.

Therefore, as an additional contribution of this study, we show the invalidity of this implicit assumption as examined by Tcuigoua (2014) in the microfinance settings. This study adopts de Jong et al (2008) regression framework by decomposing the analysis into stages. In the first stage, comparative analyses using simple ordinary least square regression is run to determine the impact of firm-specific factors on MFIs capital structure on a country-by-country basis. A simple statistical analysis was run to test whether the coefficient of firm level determinants is equal across

countries. In the second stage, the use of country dummies can be a potential solution in the analysis of the impact of institutional factors on capital structure, where each country should serve as a particular observation in the second stage weighted least square regression, rather than pooling samples from all firm across countries.

In the joint determinants of capital structure variables of deposit and borrowing. This study borrows from Yan (2006) and Dzolkarnaini (2009) methodology. They examine the firm-specific joint determinants of leases and debt using the generalised method of moments (GMM) technique developed by Arellano and Bond (1991) and Arellano and Bover (1995). This study however, focus most on firm-level joint determinants of leases and debts. Thus, other institutional factors that could jointly determine deposits and borrowing were not covered in this study. With this method in place, a re-examination of joint determinants of deposits and borrowing using microfinance experience is necessary. In the next section we present the methodologies used in our study.

5.3. Methodology used in this study

In this study, we tested the applicability of existing theories (what is already known as found in other studies) to MFIs capital structure, by analysing cause and effect relationships between variables. The study followed a quantitative research approach. The quantitative research approach is useful where quantitative data are generated from large samples to test applicability of existing theory using statistical analysis (Collis and Hussey 2003). A regression based research is chosen for the present study, it builds on contributions from prior studies using different research methods (Yan, 2006; de Jong et al., 2008; Dzolkarnaini, 2009; Strom et al., 2014). Building on Strom, D'Espallier and Mersland's study, this study links board gender diversity to capital structure of MFIs. The study also extends on the study of Tchuigoua (2014). We use measures board gender

diversity as in Strom et al., (2014) to examine their effect on of capital structure variables as in Tchuigoua (2014). This is done in chapter 6. Chapter 7, which links institutional factors and MFI capital structure builds on the methodology used in de Jong et al., (2008). The examination of joint determinants of MFI capital structure variables builds on the methodology of Yan (2006) and Dzolkarnaini (2009).

Building from previous microfinance studies (Strom et al., 2014; Tchugoua, 2014), this study added more explanatory variables and used a larger number of observation, which is expected to add explanatory power to the equations. The study used capital structure and governance theories to study the determinants of MFIs capital structure. It also adopted the unique decomposition of MFIs capital structure. The decomposition was meant to provide a clear explanation of the determinants of MFIs capital structure. The selection of methodology that was used in this study followed Thomas Kuhn's assertion that devising new approaches and methodologies, and changes in the perception on evaluation of familiar data could lead to discovery of new knowledge (Kuhn, 1996). Although this study does not bring about a paradigm shift, the Kuhn's assertion was useful to enlighten the design of this study.

5.4. Research design

This study attempts to determine the factors affecting capital structure decision of MFIs. It will also establish whether factors found to be significantly determining capital structure of firms in developed and developing are also equally significant to MFIs. We use quantitative data analysis approaches to establish the cause-effect relationships based on factors reported in previous studies as explained in theoretical background (Chapter 2) and empirical theory (Chapters 3 and 4). Theoretical-based studies provide the fundamental framework to develop the research questions.

The evidence from the empirical based studies helps to give a clearer indication of the expected empirical relationship between variables under investigation.

The study makes use of a quasi-experimental research design (Panel study or Longitudinal survey) that involves repeated observations of the same variables over long periods of time. The prime aim of the quasi-experiment is to analyse causal relationships between independent and dependent variables (Gill and Johnson, 2010). The use of longitudinal data (panel data) enhances tracking changes in measured variables and relationships overtime (Hair et al, 2006). It allows us to control for certain unobserved characteristics of individual firms (MFIs) and facilitates causal inference in situations where inferring causality would be very difficult in case we had only one year (single cross section) observation. Moreover, the use of panel data allows us to study the importance of lags in behaviour or the results of decision making, as in longitudinal or panel data, both the values and the ordering of the data points have meaning (Wooldridge, 2010; Verbeek, 2004). By studying the repeated cross-section of observations, panel data are better suited to studying dynamic changes (Gujarat, 2003).

5.5. Sample selection procedures

5.5.1. Sampling source

Microfinance institutions firm level data was collected from the Microfinance Information eXchange (MIX) database. The Mix Market is a web-based platform that provides information on individual microfinance institutions. The MIX database aims to promote transparency and information flow by providing reliable and comparable information on microfinance practicality, both financially and socially. Many studies in the field of microfinance use the Mix database (Cull et al., 2009; Ahlin et al., 2011; Imai et al., 2012; Bogan, 2012, Tchuigoua, 2014).

The Mix market platform is publicly available platform that discloses information of more than 1,900 microfinance institutions, 200 partners and nearly 100 investors (mixmarket.org). Mix market is a self-reporting database, for this reason, Mix market has classified reporting MFIs into five categories (diamonds) for reliability purpose. It is important to note that Mix market data is less reliable compared to data collected by third parties such as rating agencies (Mersland and Strom, 2009; Hudon and Traca, 2011). In order to address data reliability problems, we include only MFIs that are categorised in diamonds four and five in our studies. These categories of MFIs have audited financial statements by a third party auditing firm, while some are also rated by a third party rating agencies. This however, seems to be a reasonable benchmark for reliable and comparable data in our studies.

Institutional-specific data were collected from different sources. Data on macroeconomic environment and the level of financial sector development were extracted from the World Development Indicators provided by World Bank. The data that captures aspect of institutional environment came from two major sources. First, the Kaufman et al (2010) World Governance Indicators ("WGI") construct aggregate indicators from six broad dimensions of governance that measures institutional outcomes. Data on voice of accountability, political stability/lack of violence, government effectiveness, regulatory quality, control of corruption and rule of law are produced in annual series, in which a higher index number represents a better institutional outcome. From these indicators the data for control of corruption and political were extracted. The index is available in World Bank website. Secondly, a complementary approach that measures institutional-specific factors comes from the Doing business indicators of the World Bank. Data on creditor's right index and credit information index were obtained from the Doing Business website. Data on human development index was extracted from the United Nations Development

programme website. Countries with insufficient institutional-specific data were dropped from the study.

5.5.2. Initial sample selection and time period of the study

Our initial sample consists of 17,947 firm year observations between 1995 and 2014. Data was limited to MFIs with reporting diamonds four and five and we ended up with 8,080 firm year observations. We require that firm year observation must correspond to a calendar fiscal year. Therefore, all quarterly reported observations are excluded from our analysis. MFIs with duplicated firm year observation were eliminated from our data after verification. It was required that MFIs in our sample have at least two years' observations over the study period. This will allow us to control for certain unobserved characteristics of individual firm and can facilitate causal inference in situations where inferring causality would be very difficult if only a single cross section were available (Wooldridge, 2010).

MFIs that lack sufficient capital structure data required for our analysis were excluded. The study sets 2004 and 2014 as the beginning and end of the sample period. This decision is influenced by the fact that data from previous years are largely missing and fragmented. The implementation of these filters has rendered us with two separate unbalanced panels. Therefore, the study that examines the effect of female directors on MFIs capital structure have a sample of (2400) firm year observation for (584) MFIs across (79) countries covering the period of 2010 to 2014. The chapter is limited to five years because of unavailability of governance information such as female directors and board size. The chapters that examine the impact of institutional-specific factors and the joint determinants of deposits and borrowings contain a sample size of (5215) firm year observations for (645) MFIs across (56) countries for the period of 2004 to 2014.

5.6. The conceptual model

The study makes use of panel data models to explain the relationship between dependent and independent (explanatory) variables. Panel data or longitudinal data are data sets containing repeated observations of the same individuals (MFIs) collected over a number of periods (Wooldridge, 2010). In essence, panel data is a combination of cross-section and time series data (Gujarat, 2003). That is, cross-section data collected from the same individuals over a time. Panel data relates to individuals (MFIs) over time, and, therefore, is bound to be heterogeneous in these individuals. One of the major advantages of panel data analysis according to Matyas and Sevestre (1995) is that it enables us to account for unobservable factors as long as they can be considered fixed over time. Unobserved heterogeneity, are factors that cannot be explicitly specified, because the relevant statistical information is not accessible or does not exist.

Bevan and Danbolt (2004) argue that the empirical evidence on capital structure determinants based on pooled cross-sectional regression may be biased due to the failure to control for firm-specific, time invariant heterogeneity. In response to this, the analysis of panel data method is more appropriate for this study. The panel data method uses one-way error component model for disturbance, u_{it}, with

$$\boldsymbol{u_{it} = \alpha_i + \varepsilon_{it}}$$

Where:

$\boldsymbol{u_{it}}$= Disturbances

$\boldsymbol{\alpha_i}$ = Firms fixed effect, accounting for unobserved factors

$\boldsymbol{\varepsilon_{it}}$ = other variables influencing *y*

Equation (5.1) takes into account the firms fixed effect. Intimately related to the problem of efficient use of the panel data is the assumption of disturbances u_{it} that involves fixed effects or random effects inference. When unobserved heterogeneity can be viewed as random from a common population, and then it is more appropriate to postulate a random effect model. If the unobserved heterogeneity is correlated with explanatory variables or comes from heterogeneous population, then it is more appropriate to postulate a fixed effect model (Hsiao, 2003). The choice of which depends on Hausman specification test.

5.7. Econometric analysis approaches

This section presents the econometric analysis approaches used to analyse the relationship between firm level determinants such as board gender diversity and MFI capital structure in chapter 6, the impact of institutional specific factors on MFI capital structure in chapter 7, and the joint determinants of MFI capital structure in chapter 8,

5.7.1. Board gender diversity and MFIs capital structure

To answer the first two research questions of whether firm level determinants such as female directors affects the capital structure of microfinance institutions, we use the panel data approach, controlling for MFIs specific and country specific variables. There were two main reasons we chose the panel data method of estimation. The first relates to the structure of our data, which mainly consist of repeated observations of a cross-section of 584 microfinance institutions for the period of five years (2010-2014), with missing years for at least some cross-sectional units. Secondly, panel data enables us to account for unobservable factors as long as they can be considered fixed over time. This section covers the correlation and variable selection and the model specification.

5.7.1.1. Correlation analysis and variable specification

Before running the regression analysis, we performed pairwise correlation analysis. The analysis was meant to first, indicate whether variables were correlated or not. If variables were not correlated, then using several simple regressions or one multiple regression model could give the same results (Dougherty, 2006). Second, the correlation analysis helped to determine variables which are highly correlated and that could cause multicollinearity problem in our model.

Multicollinearity condition exists where there is high, but not perfect, correlation between two or more explanatory variables (Wooldridge, 2010). According to Churchill and Iacobucci (2005) when there is multicollinearity, the amount of information about the effect of explanatory variables on dependent variables decreases. As a result, many of the explanatory variables could be judged as not related to the dependent variables when in fact they are. Thus, as Churchill and Iacobucci (2005) have argued, multicollinearity condition reduces the efficiency of the estimates. How much correlation causes multicollinearity however, is not clearly defined. While Hair et al (2006) argue that correlation coefficient below 0.9 may not cause serious multicollinearity problem, Kennedy (2008) suggests that any correlation coefficient above 0.7 could cause a serious multicollinearity problem leading to inefficient estimation and less reliable results.

We further computed the variance inflation factor (VIF) for each coefficient as diagnostic statistics test to indicate how serious the multicollinearity problem could be. The VIF shows the increase in variance that can be attributed to multicollinearity (Greene, 2003). Again, there seems to be no consensus about how much VIF is harmful. For example, while Greene (2003) claims that the VIF values in excess of 20 suggest existence of multicollinearity problem, Hair et al (2006) and Gujarat (2003) suggest that VIF above 10 indicates the existence of multicollinearity problem.

5.7.1.2. Model Specification

Multiple regressions are based on a set of assumptions that have to be met before running the regression analysis and some tests have been done before interpretation of the result is made. This is required to ensure that the results are what they appear to be. In this section we explain how the model was constructed and specified. The assumptions underlying the multiple regression are: normality, referring to the shape of the data distribution; homoskedasticity, which requires that dependent variables exhibit equal levels of variance across the range of explanatory variables; linearity association between variables (Hair et al, 2006).

Test for normality we tested the distribution of each of the variables in our study using visual plot for each variable. From the visual plot it was evident that the distribution of some variables was not normal. It was skewed. These are: board size and MFI size. To remedy this problem, we adopted variable transformation suggested in the econometric literature (Wooldridge, 2010; Hair et al, 2006; Verbeek, 2004; Greene, 2003). We transformed the variables to their natural log. The log transformed variables also help to attain linearity in parameter which is a requirement for regression analysis. To treat heteroscedasticity, we run our regression with MFI clustered standard errors to correct for heteroscedasticity and autocorrelation. Using this method alone controls for most of the MFI level heterogeneity according to Petersen, (2009).

5.7.1.3. Empirical model

The baseline specification contains year and individual firm fixed effect to explain unobserved heterogeneity at the MFI level. The following is our main regression model:

$$(Capital\ structure)_{it.} = \beta_0 + \beta_1(Female\ directors)_{it} + \beta_2(MFI\ controls)_{it} + \beta_4(Country\ controls)_{ijt.} + \epsilon_{it.} \quad (5.1)$$

Where index *i* denotes individual MFIs, *j* indexes country, and *t* year, *capital Structure* is one of the five measures of capital structure used by the firm (Leverage, borrowing, deposits, equity and subsidies). *Female directors* are measured by the indicator variable of female on boards or the set of other female director definitions (D_female director≥1, % female directors, # female directors and D_3female directors≥3). MFI controls comprises of MFI characteristics such as board size, performance variables, size, age, risk and regulation. Country control variables comprise of economic growth and HDI. ϵ_{it} is the homokedastic error.

We begin by estimating an ordinary least squares (OLS) regression. A usual problem in cross-country panel-data studies is the existence of unobserved heterogeneity that can make OLS estimates problematic. Since any unobserved heterogeneity problem can be, induced by independent variables that are not observable or unobservable (i.e., not included in the regression model). Therefore, the estimators provided by these regressions may be inconsistent or biased since we assume that individual fixed effects are uncorrelated with our MFI level explanatory variables.

Since OLS estimators would yield bias estimates, we also estimate the random effects model by assuming that the unobserved effect is uncorrelated with all explanatory variables, but exploits the serial correlation in the composite error in a generalised least squared (GLS) framework (Wooldridge, 2010). Compared to fixed effect model, random effect is better fit to deal with time-invariant explanatory variables. Our key explanatory variable (female director variable) is constant over time, making it difficult to employ fixed effect estimators. For this reason, all variables that are constant over time are swept away by the fixed effect transformation. Random-effects model is better suited for our data because it controls for potential correlation that could exist between regressors and for unobservable individual country effects. Random effect estimates may not be

consistent if the true model is fixed effect. However, both OLS and random effect estimators would yield biased estimates if there were a presence of endogeneity issue such as reverse causality.

5.7.1.4. Endogeneity issues in estimating the relationship between female directors and MFIs capital structure

When analysing the effect of female directors on MFIs capital structure, endogeneity problems may arise. Several empirical studies have argued that female directors and firm outcomes are jointly endogenous (Hermalin and Weisbach, 2003; Farrell and Hersch, 2005; Adams and Ferreira, 2009; Carter et al., 2010; Strom et al., 2014; Sila et al., 2016). They argue that the inclusion of female directors on boards is a choice that firms have to make to in order to suit their own operating environments and use it as the bargaining power among the various stakeholders of the firm. Therefore, it is important to consider these when estimating the relationship between female director and capital structure of MFIs. To accurately test whether female directors affect MFIs capital structure, at least two alternative explanations are considered. That is, the relationship is driven either by reverse causality or by sample selection bias.

The first explanation is that capital structure variables may be direct causes of changes in the board gender diversity. Rather than proportion of female directors affecting capital structure, MFIs financing choice may affect the proportion of female director on boards. Farrell and Hersch (2005) argue that although boards may have internal tastes for diversity they also appear to respond to outside pressure to add women directors. If this is the case in MFIs where access to a particular type of funding requires MFIs to have more female directors on boards, MFIs may decide to increase female representation on boards in order to have access to that particular class of funding. One cannot rule out the possibility that capital providers are more likely to choose MFIs that are gender bias in their board composition. The second endogeneity issue is the sample selection bias.

Sample selectivity may affect both the selection of female directors and MFIs capital structure. For example, MFIs that give emphasis to social performance may select of female directors or female directors may tend to self-select with MFIs with good social performance. However, the outcome of this selectivity may affect the capital structure of MFIs.

To explain this better, sample selectivity may influence both the demand and supply of female directors by MFIs. On the demand side, the selection of female director might be related to the emphasized focus on social performance, that is, MFIs appoint female directors because they induce higher social performance. Therefore, MFIs hire female directors to show their level of social performance as may be required by investors and not because of the female director's qualification. On the supply side, MFIs with good social performance record may tend to attract more female directors as evidence show from non-financial literature that female directors may identify better with and offer their services to socially responsible firms (Adams and Funk, 2012). Therefore, examining the effect of female directors on MFI financing choice in a single equation-context without addressing the selectivity issue may bias our estimate of female directors.

To address this endogeneity, we use an instrumental variable approach similar to the approach of Strom et al., (2014). They study the effect of female leadership (female CEO, female chair and female director) on microfinance institutions financial performance and governance, where female leaders endogenously determine MFI performance and governance. To address the issue of reverse causation, they use the Heckman (1978) model for an endogenous dummy variable. We follow their approach and use two-stage endogenous dummy variable model to capture exogenous variation of female directors on MFI capital structure. Furthermore, we handle sample selection problem by the inverse Mills ratio (IMR) test.

5.7.1.5. Treatment strategy

To measure the influence of female directors on MFIs capital structure, we require an empirical model that takes into account the issues of reverse causation and selection bias. In this section, we introduce an Instrumental variable (IV) model that considers these issues. We then argue that the commonly used ordinary least squares (OLS) and random effects estimators cannot produce reliable inferences for models of this type. Finally, we propose the Heckman (1978) endogenous dummy variable model as an appropriate estimator. We have established in the previous section that MFIs characteristics and other stakeholders can influence the proportion of female directors on boards. We follow the two-step procedure laid down by Wooldridge (2010).

In the first step, we use a straightforward probit method to predict the likelihood of a female director choice. Thus, in the case of female director variable that is dichotomous, we run a probit regression:

$$Pr(D\_female\ director) = f\ (Social\ mission + Institutions + Controls + Errors) \quad (5.2)$$

This relation is important in our second regression where female director may be endogenously determined. Therefore, when the capital structure variable is the dependent variable, our estimating relation is presented as follows for the case of leverage:

$$LEV = f\ (Female\ directors + MFI\ controls + Country\ control + Errors). \quad (5.3)$$

In the second step, the predicted likelihood is used in a random effect model as an instrument for female director. The two-step method has an advantage whereby female director is regressed on variables that are possibly a proxy for the match with female directors. This involves gender bias and social mission variables, such as the percentage of female managers, percentage of female borrowers and loan balance, but also institutional variables, such as the MFIs legal status. The

generated instrument, that is, the given probability of female director, is likely to be highly correlated with the female director, but not with any measure of capital structure. According to Wooldridge (2010), the generating regression in Equation (5.2) does not need to be correctly specified in order to generate a useful instrument.

Thus far, the study has not considered any potential self-selection bias that may arise from the fact that MFIs self-select female directors. One cannot rule out the possibility, however, that socially responsible MFIs may tend to appoint more female directors or attract more female directors. In such case, the two-step method can be easily used to device an Inverse Mills ratio to test for sample selection bias. Following the general test for sample selection proposed by Wooldridge (2010. pp. 937-945). Specifically, we compute the inverse Mills ratio, denoted by *Lambda,* from the first-step probit estimate of Equation (5.2) as before, and then include the *Lambda* in the second-step regressions. If the *Lambda* is significant, then there is a case for sample selection bias.

The study includes a number of controls variables in our capital structure regressions in order to reduce MFI specific heterogeneity problem as much as possible. In the first instance, the regression estimate was run with MFI clustered standard errors to correct for heteroscedasticity and autocorrelation. Using this method alone controls for most of the MFI level heterogeneity according to Petersen, (2009). Additionally, the MFI level and country level variables included in the regression control for country heterogeneity among MFIs. Lastly, our regression includes time indicator variables and main world regions indicator variables in order to control for market wide impacts in our capital structure regression. By implementing methods such as panel data, instruments and a wide range of control variables. The estimate should at least show a reliable correlation, with causality only reported in our capital structure regression, after taking account of the endogeneity of female directors.

Robustness checks using various estimation methods is conducted. The study uses a different IV method for the capital structure estimation, where the instruments are variables that are significantly to related to female directors in Equation (5.2). Adams and Ferreira (2009), Carter et al (2010), Liu et al (2014), and Strom et al (2014) also show that the firm outcomes may be sensitive to the definition of female director. We perform regression with different definitions. In particular, we examine the Konrad et al (2008) critical mass theory with an indicator variable being one if the number of female directors is equal or larger than three. Other important female director measures put to the test are the fraction of female directors and the absolute number of female directors. Social performance variables are included in the Heckman model to account for its impact on MFIs capital structure. Furthermore, lagged financial and social performance variables were added on the right hand side variables and the Heckman model was rerun.

5.7.2. The impact of firm-specific and institutional-specific factors on MFIs capital structure

5.7.2.1. The impact of firm-specific factors

To answer the third resarch question which seeks to analyse the impact of firm-level determinants on MFIs capital structure, by testing the conventional theoretical framewok on capital structure choice of firms. The study run an ordinary least-squares regressions with the two different capital structure variables of MFIs (leverage and subsidies) as dependent variables and firm-specific factors as explanatory variables for each of the 56 countries (leverage) and 54 countries (subsidies) in the sample as follows. Take leverage for example.

$$LEV_{it} = \beta_{0it} + \beta_1 TANG_{it} + \beta_2 RISK_{it} + \beta_3 PROF_{it} + \beta_4 LIQUI_{it} + + \beta_5 SIZE_{it} + \beta_6 AGE_{it} + \varepsilon_{it} \quad (5.4)$$

Where i denotes an individual MFI and t denotes time. It is important to note that observed countries in slightly lower when the dependent variable is subsidies. This is due to the fact MFIs

in some countries have not benefited from subsidized funding over the sample period. Next, the study conduct a few statistical test. First, it test whether the coefficients of Firm-specific determinants are equal across countries. The procedure includes six diffrent test to examine whether one or more of the six firm-specific coefficients, namely, tangibility, risk, profitability, liquidity, size and age have the same value for all countries in the sample. To test that each explanatory factor is same across countries, the study first conduct an unrestricted regression and then calculate the average coefficients across observations to find the mean value. The observed explanatory factor is further deducted from the average coefficient to examine how far it is from the mean value. Then test whether it is significantly different from zero. If it is statistically and significantly different from zero, then the coefficients are not same across countries otherwise it is.

Second, the study use a different approach to test whether the coefficients of all Firm-specific determinants are equal across all the 56 countries for both models. The study make use of the joint test of significance of regression coefficients proposed by Verbeek (2004, p.27), where a single ristricted regression model imposes that all the 6 Firm-specific coefficients are the same across all countries. This test can help in deciding whether it is appropriate to use a single model for MFIs in all countries. Where the research question is not rejected, it is asumed that Firm-specific coefiicients are same across countries. The foregoing test conducted on the equality of Firm-specific coefficients are meant to provide additional evidence to either reject or accept the second approach. However, in the case of rejection, it helps identify which Firm-specific variables determines such a rejection. The statistics of joint test of significance of regression coeffcients is defined as follows;

$$f = \frac{(S_R - S_{UR})/J}{S_{UR}/(N-K)}$$

(5.5)

Where S_R is the sum squared residuals of the restricted model, and S_{UR} is the sum squared residuals of the unrestricted models. N is the number of observations, J is the number of regressors omitted in the restricted models (It shows the difference in degree of freedom *df* between restricted and unrestricted models). K is the number of regressors remaining in the restricted model including the intercept. Using the Seemingly Unreleted Regression (SUR) estimation method, the study obtains S_{UR} by adding all the SSR generated from the 56 and 54 equations of Firm-specific determinants of leverage and subsidies respectively as in Equation (5.4). Furthermore, the study obtain the S_R using the SUR method as well. The SSR added to the system was derived from a single restricted equation that assumes Firm-specific coefficients are the same across countries. The value of the *f*-statistics determines whether to reject or accept the equality of Firm-specific coefficients across countries in both leverage and subsidies model respectively.

5.7.2.2. The impact of institutional-specific factors

Turning to the fourth and fifth research question (i.e., do the institutional-specific determinants affects MFIs capital structure directly and indirectly).This study used a procedure similar to de Jong et al (2008) who estimate the direct and indirect impact of country specific factors on firms financing choices. MFI capital structure variables can be described as leverage and subsidies. In the first step, we run a pooled OLS regression for all MFIs in all countries, for each fiscal year, considering cross-country diffreneces through country dummies. The equation can be described as follows, for example leverage.

$$LEV_{ijt}=\sum_{t=1}^{11}\sum_{j=1}^{56}\alpha jt\, d_{jt}+\sum_{t=1}^{11}\sum_{j=1}^{56}\beta_1\, d_j TANG_{ijt}+\sum_{t=1}^{11}\sum_{j=1}^{56}\beta_2\ d_j RISK_{ijt}+$$

$$\sum_{t=1}^{11}\sum_{j=1}^{56}\beta_3\, d_j PROF_{ijt}+\sum_{t=1}^{11}\sum_{j=1}^{56}\beta_4\, d_j LIQUI_{ijt}+\sum_{t=1}^{11}\sum_{j=1}^{56}\beta_5\, d_j SIZE_{ijt}+$$

$$\sum_{t=1}^{11}\sum_{j=1}^{56}\beta_6\, d_j AGE_{ijt}+ u_{ijt} \qquad (5.6)$$

Where LEV_{ijt} is one of the capital strucure variable of MFIs. $TANG_{ijt}$, $RISK_{ijt}$, $PROF_{ijt}$, $LIQUI_{ijt}$, $SIZE_{ijt}$, AGE_{ijt} are Firm-specific variables of MFI i in country j and time t: d_j represents the country dummies. The equation yields results for each of the Firm-specific variables and cross country dummies. The country dummy coefficients represent the capital structure (which are the countries leverages and subsidies after correcting for the impact of Firm-specific factors). For example, The country dummy coefficients of leverage is the overall measure of indebtedness of MFIs in a particular country for a particular year . In other words, it measures the level of intensity of capital strcture undertakings in a particular country.

The analyses the impact of intitutional-specific variables on MFI capital structure using the Weighted Least Squares (WLS) regressions. Weighted Least Squares can often be used to maximize the efficiency of parameter estimation. This is done by attempting to give each data point its proper amount of influence over the parameter estimates (Wooldridge, 2010). As Gujarati (2003) argued that any procedure that estimate data equally would probably give less precise measured points more influence than they should have and would give highly precise points too little influence. Compared to other least squares method, weighted least squares is an effcient method that makes use of small data sets (Wooldridge, 2010). Therefore, weighted Least squares is an estimator used to adjust for a known form of heteroskedasticity, where each squared residual is weighted by the inverse of the (estimated) variance of the error (Wooldridge, 2010)

In the second stage, the study first examine the direct impact of institutional factors in explaining the values of country dummy coefficients α_{jt} generated in Equation (5.6). The value of the country dummy coefficients represents the countries capital structure variables (in this case leverage) after correcting for the impact of Firm-specific factors. We apply the Weighted Least Squares regression where the weight used is the inverse standard errors of the corresponding countries dummies. The weight is inversely proportional to the variance of the observation. These weights ensures that MFIs in each country are given the proper amount of influence over the parameter of estimates. The regression specification in the case of leverage is writen as follows:

$$\alpha_{jt} = \gamma_0 + \gamma_1 CRERIGHT_{jt} + \gamma_2 CREINFO_{jt} + \gamma_3 LEGAL_{jt} + \gamma_4 FINDEV_{jt} + \gamma_5 CORRUP_{jt} + \gamma_1 POLSTA_{jt} + \gamma_1 REGUL_{jt} + \gamma_1 GDP_{jt} + w_{jt} \quad (5.7)$$

Where the dependent variable is the estimated values of country dummy coefficients (α_{jt}) in the Equation (5.6). $CRERIGHT_{jt}$, $CREINFO_{jt}, LEGAL_{jt}, FINDEV_{jt}$, $CORRUP_{jt}$, $POLSTA_{jt}$, $REGUL_{jt}$, and GDP_{jt} are institutional-specific variables defined in Table 3.5. Unlike de Jong et al., (2008) etimation that used single capital structure for each country, the estimation in Equation (5.7) was able to capture a single capital structure (leverage and subsidies) for each year in each country, allowing for the fact that Firm-specific coefficients are different across countries. The study test various reduced forms of this equation.

Similarly, in the spirit of de Jong et al (2008) the study analyse the indirect impact of intitutional specific variables on MFI capital structure using the Weighted Least Squares (WLS) regressions. Due to data limitations, the study use a single capital structure for each country as observation[4].

[4] For example, Countries like Nigeria and Jordan have 6 and 1 data point in a particular year. Therefore, applying the method in Equation (3.3) to the indirect impact would render us with fewer observations that make it impossible to run a regression.

We determine the indirect impact of institutional factors by estimating its effect on Firm-specific variables. This procedure is straight forward and simple, we first estimate the regression coefficients of all our Firm-specific variables as in Equation (5.4) for each country in our sample. The values of the generated coefficients of Firm-specific variables is then regressed against our institutional variables using the weighted least square regression discussed above. The weight used in Equation (5.8) is the inverse standard errors of the corresponding Firm-specific coefficients. Typically, the observation represent averages and the weight are the number of elements that gave rise to the average.The equation can be described as follows;

$$\beta_{kj} = \lambda_0 + \lambda_1 CRERIGHT_j + \lambda_2 CREINFO_j + \lambda_3 LEGAL_j + \lambda_4 FINDEV_j + \lambda_1 CORRUP_j + \lambda_1 POLSTA_j + \lambda_1 REGUL_j + \lambda_1 GDP_j + e_k \quad (5.8)$$

Where k denotes the estimated betas (β_{kj}, j= 1, 2, ..., 6) in Equation (5.4). $CRERIGHT_j$, $CREINFO_j, LEGAL_j, FINDEV_j$, $CORRUP_j$, $POLSTA_j$, $REGUL_j$ and GDP_j are institutional[5] characteristics defined in Table 3. Various reduced form of this equation is tested as well. This analysis is the second stage of a two-stage procedure.

To test the reliability of our results, the study use annual average data from the inception. In the first instance, we take the average of all the Firm-specific data for each particular country. This leaves us with an average single observation for each country. However, due to data limitations, some countries were dropped after implementing this approach. For example, Jordan has one MFI with eleven firm year observations. After taking an average of these observations, we are left with one observation for Jordan which is not enough to run the first stage of the regression on Jordan.

[5] The analysis of both the direct and indirect impact of institutional variables is second stage of a two-stage procedure.

Therefore, countries with insufficient data were eliminated, leaving the study with 30 countries from the original 56 countries as presented in Figure 5.1 below.

Figure 5.1. Differences in the composition of sample based on full data and annual average data.

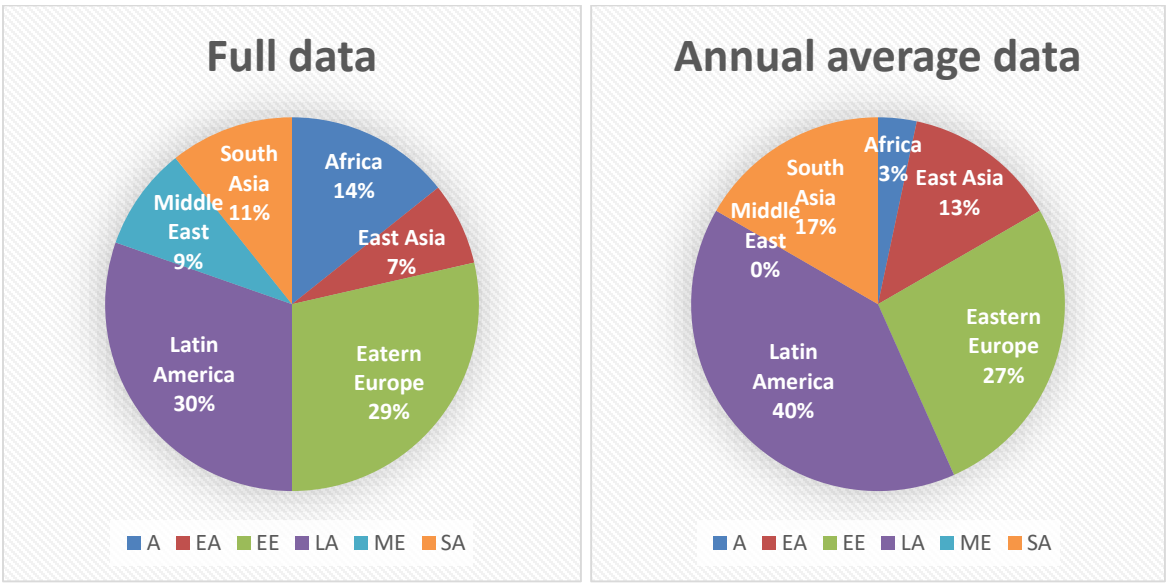


Figure 5.1 shows the differences in spread of MFIs across regions. In the full data, MFIs are spread across all the six regions, with the highest concentration in Latin America and the lowest in East Asia. However, in the annual average data, Latin America is still the region with the highest concentration of MFIs, folllowed by Eastern Europe. Middle East is having zero observation while Africa has the lowest concentration of MFIs.

In the first stage, the study run a pooled OLS regression as in Equation (5.6) conisdering cross-country differences through country dummies. The values of the dummy coefficients α_j generated in the first step is run against the institutional specific factors in Equation (5.7). The equation can be described as follows, for instance leverage.

$$\alpha_j = \gamma_0 + \gamma_1 CRERIGHT_j + \gamma_2 CREINFO_j + \gamma_3 LEGAL_j + \gamma_4 FINDEV_j + \gamma_5 CORRUP_j + \gamma_1 POLSTA_j + \gamma_1 REGUL_j + \gamma_1 GDP_j + w_j \quad (5.9)$$

Where the dependent variable is the estimated values of country dummy coefficients for each country (α_j). $CRERIGHT_j$, $CREINFO_j, LEGAL_j, FINDEV_j$, $CORRUP_j$, $POLSTA_j$, $REGUL_j$, and GDP_j are institutional-specific variables defined in Table 3.5. Using the annual average data in the first stage, the estimation in Equation (5.9) was able to capture a single capital structure (leverage and subsidies) for each country, allowing for the fact that Firm-specific coefficients are different across countries. Note that, the study runs the first and second stage regression using average country values for the sample period. The study test various reduced forms of this equation.

5.7.3. Empirical relationship between deposits and borrowings

Turning to the sixth research question (i.e., what is the empirical relationship between deposits and borrowings? Are they substitutes or complement? The link between borrowing and deposits is examined using the dynamic panel data method. Generally, Equation (5.10) is modified so that borrowing measure becomes explanatory variable in the deposit equation and vice-versa. Gujarati (2003) argues that, in many economic situations, it is not uncommon for the dependent and independent variables to be determined simultaneously, rendering a one-way or unidirectional cause-and-effect relationship less meaningful. Moreover, Baltagi (2005) suggests that many economic relationships are dynamic in nature in which the dynamic relationships are characterised by the presence of a lagged dependent variable among the regressors. By examining deposits and borrowing simultaneously, the behaviour of the determinants in influencing the decisions can be better ascertained and also the extent to which borrowing and deposits are substitutes or complement are investigated in this present study.

Principally, the dynamic panel data method involves the two-step generalised method of moments (GMM) technique developed in Arellano and Bond (1991) and Arellano and Bover (1995). This technique has been used by Yan (2006) in examining lease-debt substitutability issue in the US. Arguably, the technique is advantageous in terms of simultaneously controlling for endogeneity problems and firms fixed effects. Following Dzolkarnaini (2009), the present study uses the dynamic panel method to apply the GMM technique. Examining GMM using panel data method is advantageous since it "allows the researcher to better understand the dynamics of adjustment" (Baltagi, 2005, p. 135). More formally, the following dynamic panel models are estimated:

$$DEP_{it} = \alpha_0 + \alpha_1 DEP_{i,t-1} + \alpha_2 BORR_{it} + v_k X_{it,k} + u_{it} \quad (5.11)$$

$$BORR_{it} = \alpha_0 + \alpha_1 BORR_{i,t-1} + \alpha_2 DEP_{it} + v_k X_{it,k} + u_{it} \quad (5.12)$$

Where i denotes an individual MFI and t denotes time. DEP_{it} denotes deposits ratio and $DEP_{i,t-1}$ represents one-period lag of deposit ratio. $BORR_{it}$ represent borrowing, $BORR_{i,t-1}$ one period lag of borrowing ratio. $v_k X_{it,k}$ is the vector of all explanatory variables affecting capital structure decisions, $\boldsymbol{\alpha_0}$ constant term and $\boldsymbol{u_{it}}$ disturbance term. The disturbance term is specified as a two-way error component model as follows:

$$u_{it} = \mu_i + \tau_i + \gamma_{it} \quad (5.13)$$

Where μ_i denotes MFIs fixed effects, τ_i represent year fixed effects and γ_{it} remainder disturbances. In the GMM estimator, the MFI fixed effects μ_i are removed from Equations (5.11) and (5.12) by means of a differencing transformation, producing equations that can be estimated using instrumental variables. Interesting, STATA 13.1 command "xtabond" automatically does the lagging of dependent variable, first-difference transformation of the original equation and

chooses the appropriate instrumental variables in the estimation. Thus, the manual tasks of first-difference transformation and instrumental variables selection as in Yan (2006) can be avoided. The Sargan test is used to test the joint null hypothesis that the model is correctly specified and that the instruments used in the estimation are valid. The consistency of the GMM estimator is indicated by a serially uncorrelated disturbance term. If the disturbance is serially uncorrelated, there should be evidence of negative and significant first-order serial corrrelaion in the differenced residual, but no evidence of second-order serial correlation.

The asessment of deposit-borrowing substitutability is indicated by the sign of α_2 in Equations (5.11) and (5.12). The assumption that borrowing and deposits are complements is rejected if α_2 negative. Following Yan (2006) and Dzolkarnaini (2009), the variation in the substitutability/complemetarity between deposits and borrowing under different institutional environment is also investigated (i.e., seventh research question). In so doing, three institutional characteristics are examined, namely credit right index, credit information index and financial sector development. These institutional characteristics are selected to determine the extent to which the substitutability/complementarity relationship between borrowing and depsosits is sensitive against the degree of information asymmetry. To investigate the relationship, the two-step GMM technique is used to estimate the following dynamic panel model:

$$DEP_{it} = \alpha_0 + \alpha_1 DEP_{i,t-1} + \alpha_2 BORR_{it} + \alpha_3 BORR_{it} * INST_{it} + v_k X_{it,k} + \mu_i + \tau_i + \gamma_{it} \quad (5.14)$$

Where DEP_{it} is the ratio of deposits, $DEP_{i,t-1}$ represents one-period lag of the deposits ratio, $BORR_{it}$ denotes the borrowings ratio. $INST_{it}$ is the institutional characteristics for the interaction (credit right index, credit information index and financial sector developement). $v_k X_{it,k}$ is the

vector of all explanatory variables affecting MFIs capital structure decisions. α_0 constant term, μ_i denotes MFIs fixed effects, τ_i represent year fixed effects and γ_{it} remainder disturbances.

Notice that the sensitivity is examined based on the coefficients of the interactive variable $BORR_{it}$* $INST_{it}$. Contrary to Yan (2006), the institutional variables for the interaction are measured in the original form rather than using dummy variable approach.[6] The use of dummy variable is being criticised for reduced information content of the variable. Similarly, the firms fixed effects μ_i, are removed from Equation (5.14) by means of a differencing tranformation, producing an equation that can be estimated using instrumental variables. The Sargan test and the second-order serial correlation are also checked to ensure that the model is correctly specified, the instrument used in the estimation are valid and the GMM estimator is consisent.

5.8. Variable definitions and measurements

The selection of variables for this study is mainly based on the theoretical propositions of capital structure theories and the findings of many prior empirical studies. Although a model that could best explain the majority of the observed capital structure variation is desirable (indicated by a higher value of adjusted R^2). Extra precaution was taken in the model specification, such that the practice of adding more explanatory variables to increase the adjusted R^2 value (Dougherty, 2002, p. 146) was avoided. Therefore, the practice of randomly selecting variables that could boost the adjusted R^2 of a model is considered as an inefficient modelling strategy.

On this note, the study specifically focuses on the determinants of microfinance institutions capital structure within the established theories of capital structure. Hence, the selected explanatory

[6] For each firm characteristics, Yan (2006) separately construct dummy variable taking the value of 1 if the particular firm characteristics is above average and 0 if otherwise.

variables are those that seem plausible on a priori grounds and could explain the capital structure of MFIs. Given the fact that many prior studies have used various measures and proxies in defining the variables, for example, the capital structure literature usually measures financing choice variables either by their book value or by market value. However, in the case of MFIs that are typically small and non-listed, getting their market based capital structure value seems very impossible. Therefore, accounting indicators is the only proper measure that can be used to evaluate the capital structure and other firm level variables of MFIs. This study outlines each variable measure and the rationale for selecting it.

5.8.1. Dependent variables

Following Tchuigoua, (2014) and Bogan (2012), the value of borrowed funds (short or long-term) and equity funds (stockholder or donated equity) are employed as the primary measure of capital structure in their analysis. We use four main measures of capital structure which are readily available or computed from the information provided by the MIX database. The first measure is leverage. Following Tchuigoua (2014), we measure leverage as the ratio of total liabilities divided by total asset *(LEV)*. It therefore, includes both debt and non-debt liabilities such as deposits. The argument for using leverage rather than debt, is that, leverage unlike debt is well defined (Welch, 2007). When referring to theory for an interpretation of the basic capital structure regression, the corporate finance literature typically does not explicitly distinguish between debt and non-debt liabilities. Moreover, since leverage is the ratio of total liabilities to total assets, the dependent variable can be directly linked to the regulatory view of banks' capital structure (Gropp and Heider, 2010). But a financial firms capital structure is different from non-financial firms' capital structure since it includes deposits. We therefore decompose MFIs leverage into deposits and non-deposit liabilities.

Given that, the MIX market database decomposes liabilities into deposits for deposit taking MFIs and borrowings otherwise known as non-deposit liabilities. It is however difficult to determine the exact amount of debt contracted by various MFIs. This information is not yet available in the MIX market database. Consistent with Bogan (2012) and Tchuigoua (2014), we decompose the leverage measure into two, which is, Borrowings (non-deposit liabilities) divided by total assets *(BORR)* and deposits divided by total assets *(DEP)*, in order to estimate the effect of the determinants on each of the components.

The second measure is the equity capital. Following Bogan (2012) we normalize total equity share with the book value of total assets *(EQUI)*. The third measure of capital structure used in this study is donated equity divided by total assets *(SUBS)*. Donated is a contributory or subsidized equity capital received by MFIs in the form of cash donations and grants. Previous literatures have either measured donated equity as a ratio of total equity (Hudon, 2010; Hudon and Traca, 2011), or donated equity as a ratio of total assets (Bogan, 2012; Tchuigoua, 2014). In this study, we follow the later approach of (Bogan, 2012; Tchuigoua, 2014) to normalize donated equity with the book value of assets. However, it is important to note that the measure of donated equity alone seems to underestimate the scale of subsidies accruing to MFIs, given that donations received by MFIs for operating and non-operating expenses are not included to microfinance donated equity (Hudon and Traca, 2011).

5.8.2. Explanatory variables

5.8.2.1. Firm-specific variables

5.8.2.1.1. Female directors (D_Female directors)

The key variable of interest in this study is the female directors on boards. Many previous studies have used percentage of female directors on board as a measure of board gender diversity (Adams and Ferreira, 2009; Ahern and Dittmar, 2012). Other studies employ number of female directors or a dummy variable to weigh the influence of women directors based on the critical mass idea (Konrad et al, 2008; Simpson et al, 2010; Strom et al., 2014; Liu et al., 2014). We follow Strom et al., (2014) four different definitions to measure female director's influence on corporate board. A dummy variable for the presence of one or more female directors, a percentage of female directors of all directors, number of female directors and a dummy to measure three or more female directors on a corporate board.

5.8.2.1.2. Board size (Board size)

The second explanatory variable is the board size, which is measured in log specification in most studies (Yermack, 1996; Wen et al., 2002; Mersland and Strom, 2009; Liu et al., 2014;). We follow Wen et al (2002) and Liu et al., (2014) board size measurement criteria that is, the natural logarithm of the number of board of directors in our regression.

5.8.2.1.3. Financial performance (ROA)

Following recent literatures on MFIs performances, (Hermes at al., 2011; Quayes, 2012; Bogan, 2012; Strom et al., 2014). We group our performance variables into two categories, namely, financial performance and social performance. This study used return on assets (ROA) as the financial performance variables. Return on assets is measured by adjusted net operating income divided by adjusted average total assets. It is assumed that firms with high return on assets will prefer internal sources of funding. Thus, return on asset is added to the model in order to extract any of these potential effects.

5.8.2.1.4. Social performance (Female borrowers and Loan balance/GNI)

The second category is the social performance group. As far as MFIs are concerned, the standard way of focusing on their social performance is through the measures of outreach in various forms (Gutierrez-Nieto et al., 2009). Following the Mix Market standard definition, social performance is measured as the average loan size divided by GNI per capita that measures the depth of outreach. While number of active women borrowers divided by the adjusted number of active borrowers measures the breadth of outreach. This is wholly or partially consistent with many prior studies (Louis et al., 2013; Hermes at al., 2011; Gutierrez-Nieto et al., 2009; Cull et al., 2009).

5.8.2.1.5. Tangibility (TANG)

Following Tchuigoua (2014), tangibility is defined as the ratio of net fixed assets divided by MFIs total assets. Prior studies have found that asset specificity of firms determines the best type of capital structure choice firms employ (Williamson, 1987). This variable measures the MFIs collateral level. Alves and Ferreira (2011), and Campello and Giambona (2013) empirically observe a strong positive relationship between firm's tangibility and capital structure. This is due to firm's larger asset base, which makes them to have more capacity to issue debt since assets could be used as collateral. However, firm's that either are unable to provide collateral will have to pay higher interest rate or will be forced to issue equity capital (Scott, 1977). Therefore, tangibility as firm-specific variable is measured as a ratio of net fixed assets divided by MFIs total assets.

5.8.2.1.6. Risk (RISK)

Risk is defined as the outstanding balance of portfolio on arrears over 30 days plus total gross outstanding renegotiated portfolio divided by adjusted gross loan portfolio. This information is

provided in the MIX database and is consistent with prior studies on MFIs (Ahlin et al., 2011; Tchuigoua, 2014).

5.8.2.1.7. Profitability (PROF)

Profitability is defined as the net operating income divided by total assets. It measures MFIs capacity to use its assets to generate returns. Unlike the general capital structure literature that measures profitability using ROA (Booth et al., 2001; Demirguc-Kunt and Maksimovic, 2002; Gianetti, 2003). This study follow the measure of profitability proposed in the literature of microfinance, for example, Tchuigoua (2014).

5.8.2.1.8. Liquidity (LIQUI)

Liquidity is the total cash and cash equivalent divided by total assets. Unlike previous capital structure literature (de Jong et al., 2008; Gungoraydinoglu and Oztekin, 2011), that define liquidity as total current asset as a proportion of total current liabilities. Our definition is consistent with prior microfinance literature (Tchuigoua, 2014).

5.8.2.1.9. MFI-size (SIZE)

The natural logarithm of MFIs total assets is used as a proxy for size, given that it is the easiest way to control for outlier's bias. Size has been identified by the corporate finance literature as an important determinant of capital structure decisions (Frank and Goyal, 2009). Du and Dai (2005) find a positive relationship between firm size and leverage. Larger firms tend to have less possibility of default risk, easier access to the capital market, and stronger negotiating power. This is applicable in the microfinance settings, where larger MFI tend to have the advantage of economies of scale compared to smaller MFIs.

5.8.2.1.10. MFI-age (AGE)

This study classifies MFIs into three age categories (new, young and mature) based on the maturity of their microfinance operations given by the Mix Market database. It is calculated as the difference between the year they started their microfinance operations and the year of data submitted by the institutions.

5.8.2.2. Institutional-specific variables

In the analysis of international capital structure of MFIs, this study employs different types of institutional-specific variables to test their impact on MFIs capital structure. The study makes use a number of variables characterizing legal, financial sector development and macro-economic of countries. All the institutional-specific variables are averaged over the study period. The selections of the institutional-specific variables were based on the previous microfinance literatures and are defined as follows.

5.8.2.2.1. Creditors rights index (CREDRIGHT)

The strenght of creditor's rights index measures the degree to which collateral and bankruptcy laws protect borrower and lender rights and thus faclitate lending. Unlike previous studies by (Qian and Strahan, 2007; Bae and Goyal, 2009), which used the five-point-scale built by La Porta (1997) and further extended by Djankov et al (2007). This study follow Ahlin et al (2011) and Tchugoua (2014) which used the new version of the index that ranges from 0 to 10 as provided by the *Doing Business database*. The choice of creditors right provided by Doing Businness is justified by the fact that the La Porta et al (1997) and Djankov et al. (2007) score is available only from 1978 to 2003 and is, therefore, unavailable for the period covered in this study (2004–2014).

5.8.2.2.2. Creditors information index (CREDINFO)

The credit information index measures rules and practices affecting the coverage, scope and accessibility of credit information available through either a credit bureau or a credit registry. A good credit registry may aid MFIs to access a qualitative credit information in the market. This study follows Ahlin et al (2011) and use the new version of this index that ranges from 0 to 8, with higher values indicating the availability of more credit information, from either a credit bureau or a credit registry, to facilitate financing decisions. This information is provided by the Doing Business database.

5.8.2.2.3. Financial sector development (FINDEV)

Given that domestic credit market seems to be a funding source for MFIs, the level of development in country's financial sector may facilitate access to funding sources. Following recent studies on microfinance (Vanroose and D'Espallier, 2013; Tchuigoua, 2014), this study uses domestic credit provided by the private sector percentage of GDP to measure the financial sector development, that is taken from World Development Indicators provided by the World Bank.

5.8.2.2.4. Legal origin (LEGAL)

Consistent with prior studies in microfinance (Tchuigoua, 2014), this study measures country legal tradition by a dummy variable that takes the value of 1 if the country legal origin is common-law system and 0 otherwise. This variable is gotten from La Porta et al. (1997) and Djankov et al. (2007).

5.8.2.2.5. Corruption (CORRUP)

Reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private

interests. In the case of microfinance, corruption may affects their operations and create barriers to their expansion. Unlike previous studies by Alves and Ferreira (2011) and Fan et al. (2012) which used transparency international corruption index, this study follows Ahlin et al (2011) and Tchuigoua (2014) which used the Kauffman et al (2009) governance indicators index that ranges between -2.5 to 2.5. A positive number reflects an ideal institutional outcome, meaning to say less level of corruption and vice-versa. This information is provided by the World Governance Indicator provide by the World Bank database.

5.8.2.2.6. Political stability (POLSTAT)

Political stability and absence of violence measures the perception of the likelihood of political instability and/ or politically motivated violence, including terrorism. Instability contributes to the uncertainty of returns for external investors, hence investors may reduce the likelihood and cost of any subsequent exposures by reducing the amount investments in that particular country. MFIs operating in a stable country may attrack external financing that can be channeled to higher-growth endevours. This study follow Ahlin et al (2011) to measure political stability provided by the Kaufmann et al., (2009) governance indicators.

5.8.2.2.7. Regulation (REG)

Similar to other financial institutions, most deposit taking MFIs are subject to prudential regulations (*REG*). It is therefore important to account for MFIs regulatory activities, which is consistent with prior studies of MFIs financing policies (Bogan, 2012; Tchugoua, 2014). A dummy variable of 1 is created for countries with regulatory framework for MFIs in place and 0 otherwise.

5.8.2.2.8. Economic growth (GDP)

The study finally controls for differences in growth opportunities across countries using economy-wide growth rates in gross domestic product (*GDP*). Following recent studies on microfinance (Ahlin et al., 2011; Tchuigoua, 2014), this study focus on real per capita growth as arguably the most informative single indicator of economic progress. It can be considered as an approximate summary statistic for the various institutional, technological and factor accumulation related ingredients of development.

5.8.2.2.9. Human development index (HDI)

Aguilera and Jackson (2010) show that country specific tradition and institutions plays an important role in corporate finance studies. Cultural and economic differences are likely to be found between countries. The institutional variable that controls for gender inequality and other cultural differences in our regression is human development Index gotten from UN's development programme.

5.9. Summary

This chapter presents details of the research design and focus of the present study. In particular, the chapter has outlined in details the models and empirical research technique employed in the analysis. The variables used were broadly defined and measured while the sample selection procedure was justified. Without these design, the present study could not be realised in its current form.

Chapter 6 - Results I: The effect of board gender diversity on MFI capital structure

6.0. Introduction

This chapter presents the results of the investigation of the effect of female directors on MFIs capital structure. While the literature on microfinance female leadership is voluminous (Perilleux and Szafarz, 2015; Strom et al., 2014; Boehe and Cruz, 2013; Mersland and Strom, 2009; Hartarska, 2005), our understanding remains incomplete, particularly in respect of its effect on MFIs capital structure. Using a comprehensive capital structure measure, this chapter investigates the impact of female board representation on MFIs capital structure.

An unbalance sample of MFIs over the period from 2010 through 2014 is used in the investigation. The final sample contains an unbalance panel of 584 MFIs or 2400 firm-year observations. The chapter proceeds as follows; Section 6.1 presents the descriptive statistics of the key variables, followed by a brief description of the univariate results in Section 6.2. The main results based on the multivariate analysis are discussed in Section 6.3. The robustness checks and regression diagnosis are described in Section 6.4. A brief discussion of key most recent papers presented in Section 6.5. Contributions which are new addition to literature are presented in Section 6.6. Section 6.7 summarises the chapter.

6.1. Descriptive statistics

Variable description is presented in Table 6.1. Descriptive statistics for the key variables are also presented in Table 6.2. Panel A of Table 6.2 provides summary statistics of the overall sample. The mean value of the leverage is 0.68. Equity capital and Subsidies represents 31% and 6% of the total assets respectively. The average deposit ratio for the whole sample is 19%. Borrowings represent 44% of MFI assets. 30 percent of the board members are women. This is a very high percentage compared to other non-MFI sectors. This may reflect the high percentage of female

borrowers (65%). On average, the loan balance divided by gross national income is 47%. MFIs are on average profitable. The average value of returns on assets is 0.02. This is close to studies that use data provided by rating agencies. For example, Strom et al., (2014) report an average ROA (0.01). Majority of MFIs (67%) in our sample are subject to prudential regulations. The average portfolio at risk is 0.05, which is below the 0.1 cut-off (Bruett, 2005) and consistent with what other studies (Strom et al., 2014; Tchuigoua, 2014) have reported. This shows that the average loan portfolio in our sample is healthy. GDP per capita and inflation are 4% and 6% respectively over the period.

Panel B provides descriptive statistics of MFIs distribution across the six main regions of the world and the average value of MFI level variables in each of these regions. We observe some fascinating differences across regions. Majority of MFIs in our sample come from Latin America (213 MFIs). The main source of funding for MFIs in Africa is deposits, whereas subsidies is slightly predominant in the Middle East and North Africa. Borrowing is less in Africa compared to other regions. This may not be unconnected to the fact that MFIs in these regions are less attractive to microfinance investments (CGAP, 2011). Equity is the main source of funding for MFIs in the Middle East and North Africa compared to the other regions. On average, Africa has less female board of directors in MFIs, whereas Middle East and North Africa has the highest board size.

Panel C provides detailed mean values of capital structure and MFIs level variables by country. MFIs in Congo Republic and Samoa have the highest leverage ratio of 95% and 94% respectively. While Palestine and Chile have the lowest leverage of 18% and 22%. Contries with the highest female board representations are East Timor (71%) and Serbia (67%). Togo and Poland have the lowest female board representation of 5%.

Table 6.1. Variables definition

Variable	Definition
Capital structure	
Leverage (LEV)	Total liabilities/total assets
Borrowings (BOR)	Borrowings (non-deposit liabilities)/total assets
Deposits (DEP)	Deposits/total assets
Equity capital (EQUI)	Equity capital/total assets
Subsidies (SUBS)	Donated equity/total assets
	Donated equity is the accumulated historical donations to the MFI
Female director	
D_female director	Binary: 1 # female director is 1 or more
% Female directors	Female directors as fraction of all directors
# Female directors	Number of female directors
D_female director≥3	Binary: 1 if # female director is 3 or more
Financial performance	
ROA	Return on assets
Social performance	
% Female borrowers	Number of active women borrowers/Adjusted Number of Active Borrowers
Loan balance/GNI	Adjusted Average Loan Balance per Borrower/GNI per Capita
MFI and country controls	
Board size	Number of directors
Size	Natural logarithm of total assets
Risk	Outstanding balance of portfolio on arears over 30 days + Total Gross Outstanding Renegotiated portfolio / Adjusted Gross Loan Portfolio
Age	Number of years in operation
Regulation	Binary variable: 1 if the MFI is subject to prudential regulation, 0 otherwise
GDP	Annual growth rate of the GDP per capita of a country
HDI	Human development Index

Table 6.2
Summary statistics

Panel A: Overall sample description

Variables	Mean	Median	Standard deviation	Minimum	Maximum	Obs
Leverage	0.68	0.76	0.25	0.00	1.93	2268
Borrowings	0.44	0.48	0.27	0.00	1.70	2340
Deposits	0.19	0.00	0.28	0.00	0.95	2246
Equity capital	0.31	0.24	0.23	-0.93	1.05	2359
Subsidies	0.06	0.00	0.16	0.00	1.62	1687
D_Female directors	0.79	1.00	0.41	0.00	1.00	1995
% Female director	0.30	0.27	0.24	0.00	1.00	1993
# Female directors	2.03	1.00	2.23	1.00	28.00	2095
D_Female directors>3	0.28	0.00	0.45	0.00	1.00	2147
Board Size	7.03	7.00	3.65	1.00	33.00	2103
% Female Borrowers	0.65	0.61	0.26	0.00	1.00	2121
Loan balance/GNI	0.47	0.26	0.54	0.00	2.99	2264
ROA	0.02	0.02	0.08	-0.93	0.45	2260
Size	16.42	16.31	1.92	9.11	22.18	2378
Age	2.69	3.00	0.61	1.00	3.00	2383
Risk	0.05	0.03	0.09	0.00	1.00	2153
Regulations	0.67	1.00	0.47	0.00	1.00	2396
GDP	0.04	0.04	0.03	-0.07	0.16	2397
HDI	0.64	0.65	0.09	0.32	0.84	2380

The sample consists of an unbalanced panel of 584 MFI's during the periods 2010-2014, which were found from the MIxMarket database. All variables are defined in Table 1 above.

Panel B: Capital structure and Firm Level data: mean by region

Region	Africa	East Asia and the pacific	Eastern Europe and central Asia	Latin America and the Caribbean	Middle east and north Africa	South Asia	Sample mean
MFIs	50	49	106	213	11	154	-
Leverage *(LEV)*	0.70	0.69	0.63	0.68	0.49	0.76	0.68
Borrowings *(BORR)*	0.22	0.39	0.49	0.40	0.47	0.55	0.44
Deposits *(DEP)*	0.43	0.26	0.11	0.20	0.00	0.16	0.19
Equity *(EQUI)*	0.29	0.26	0.37	0.32	0.51	0.23	0.31
Subsidies *(SUBS)*	0.08	0.04	0.05	0.05	0.26	0.05	0.06
% Female directors	0.24	0.31	0.30	0.32	0.28	0.28	0.30
Board Size	7.08	5.95	4.57	7.72	8.08	7.75	6.97
% Female Borrowers	0.63	0.79	0.43	0.59	0.62	0.88	0.65
Loan bal/GNI	0.72	0.50	0.71	0.48	0.21	0.23	0.47
ROA	0.00	0.03	0.03	0.02	0.04	0.00	0.02
Size	15.99	16.09	16.52	16.64	17.07	16.16	16.42
Risk	0.04	0.05	0.06	0.05	0.04	0.06	0.05
Regulations	0.84	0.74	0.94	0.43	0.54	0.79	0.67
GDP	0.03	0.05	0.03	0.03	0.01	0.05	0.04
HDI	0.49	0.62	0.71	0.69	0.68	0.57	0.64

Panel C: Capital structure and Firm level data: mean by country

Country	N	LEV	BORR	DEP	EQUI	SUBS	% Female directors	Board Size
Afghanistan	5	0.72	0.51	0.20	0.31	0.33	0.32	5.10
Albania	2	0.66	0.61	0.00	0.34	0.01	0.23	4.29
Argentina	9	0.63	0.55	0.00	0.37	0.00	0.29	5.20
Armenia	8	0.65	0.56	0.04	0.35	0.03	0.17	4.07
Azerbaijan	20	0.55	0.46	0.09	0.43	0.05	0.19	3.87
Bangladesh	17	0.82	0.45	0.31	0.17	0.04	0.38	10.62
Benin	7	0.80	0.34	0.46	0.19	0.02	0.34	6.39
Bhutan	1	-	0.22	0.50	0.26	-	0.11	-
Bolivia	18	0.79	0.49	0.22	0.21	0.04	0.29	6.66
Bosnia and Herze	10	0.56	0.48	0.00	0.44	0.13	0.35	4.80

Panel C: Capital structure and Firm level data: mean by country

Country	N	LEV	BORR	DEP	EQUI	SUBS	% Female directors	Board Size
Brazil	11.	0.50	0.38	0.00	0.50	0.12	0.33	3.69
Bulgaria	4	0.34	0.25	0.01	0.66	0.15	0.42	4.43
Cambodia	17	0.61	0.53	0.13	0.27	0.01	0.17	6.21
Cameroon	**2**	0.91	0.34	0.51	0.09	0.01	0.10	6.67
Chile	**2**	0.22	0.19	0.00	0.73	0.00	0.12	6.00
China	**3**	0.90	0.53	0.01	0.10	0.01	0.08	6.36
Congo, Democratic	**3**	0.44	0.16	0.23	0.56	0.27	0.19	5.60
Congo, Republic	1	0.95	0.00	0.83	0.05	0.06	0.20	15.00
Colombia	19	0.65	0.40	0.15	0.33	0.02	0.35	9.32
Costa Rica	11	0.64	0.60	0.00	0.35	0.08	0.35	5.41
Dominican Republic	8	0.71	0.41	0.22	0.29	0.07	0.27	8.63
East Timor	1	0.62	0.20	0.34	0.38	0.00	0.71	4.80
Ecuador	42	0.80	0.27	0.50	0.20	0.03	0.37	9.79
Egypt	3	0.33	0.30	0.00	0.67	0.28	0.08	10.42
El Salvador	10	0.61	0.44	0.07	0.39	0.15	0.29	9.05
Gambia, The	1	0.91	0.01	0.81	0.09	-	0.20	5.00
Georgia	10	0.68	0.68	0.01	0.26	0.00	0.29	4.59
Ghana	2	0.62	0.40	0.21	0.20	0.08	0.42	7.00
Guatemala	16	0.46	0.37	0.01	0.54	0.03	0.31	6.12
Haiti	3	0.62	0.40	0.00	0.38	0.00	0.23	4.71
Honduras	18	0.57	0.41	0.11	0.42	0.05	0.37	7.81
India	86	0.74	0.63	0.05	0.25	0.02	0.24	7.23
Indonesia	11	0.67	0.38	0.26	0.30	0.07	0.33	3.32
Jamaica	1	0.40	0.34	0.00	0.60	0.00	0.00	5.00
Jordan	1	0.52	0.51	0.00	0.48	0.16	0.33	6.00
Kazakhstan	6	0.56	0.48	0.00	0.48	0.00	0.48	4.13
Kenya	7	0.86	0.33	0.46	0.15	0.09	0.33	8.38
Kosovo	5	0.69	0.64	0.00	0.31	0.05	0.15	4.83
Kyrgyzstan	8	0.73	0.59	0.10	0.27	0.02	0.48	4.66
Laos	5	0.55	0.03	0.48	0.42	0.15	0.38	9.22
Lebanon	1	0.44	0.38	0.00	0.56	0.30	0.17	6.00
Macedonia	2	0.72	0.30	0.40	0.28	0.00	0.18	6.57
Madagascar	2	0.54	0.16	0.29	0.46	0.13	0.06	9.25
Mexico	4	0.60	0.38	0.12	0.41	0.00	0.07	12.00
Moldova	1	0.71	0.70	0.00	0.29	0.00	0.00	7.00
Mongolia	4	0.76	0.39	0.34	0.24	0.03	0.23	6.47
Montenegro	1	0.54	0.52	0.00	0.46	0.00	0.33	3.00
Morocco	3	0.76	0.67	0.00	0.24	0.20	0.26	7.00
Mozambique	2	0.55	0.08	0.38	0.45	0.03	0.07	5.67
Nepal	21	0.89	0.39	0.46	0.11	0.00	0.29	8.62

Panel C: Capital structure and Firm level data: mean by country

Country	N	LEV	BORR	DEP	EQUI	SUBS	% Female directors	Board Size
Nicaragua	18	0.71	0.55	0.04	0.29	0.08	0.34	6.94
Nigeria	11	0.71	0.07	0.54	0.29	0.00	0.21	6.14
Pakistan	16	0.71	0.43	0.22	0.29	0.11	0.34	8.40
Palestine	2	0.18	0.28	0.00	0.82	0.56	0.54	9.40
Panama	4	0.57	0.35	0.13	0.43	0.10	0.25	7.20
Papua New Guinea	1	0.90	0.00	0.88	0.10	0.00	0.15	4.75
Paraguay	6	0.83	0.27	0.52	0.17	0.00	0.21	7.84
Peru	13	0.72	0.38	0.34	0.28	0.04	0.31	7.02
Philippines	7	0.93	0.35	0.40	0.10	0.01	0.46	7.62
Poland	1	0.89	0.00	0.85	0.11	0.00	0.05	4.80
Romania	2	0.85	0.75	0.00	0.15	0.00	0.38	5.57
Russia	5	0.55	0.26	0.25	0.48	0.13	0.29	4.08
Rwanda	2	0.63	0.30	0.21	0.39	0.24	0.41	8.00
Samoa	1	0.94	0.75	0.09	0.06	0.00	0.00	3.25
Senegal	2	0.68	0.36	0.54	0.22	0.08	0.19	9.43
Serbia	2	0.46	0.16	0.29	0.54	0.33	0.67	1.20
South Africa	2	0.49	0.21	0.20	0.59	0.00	0.22	10.00
Sri Lanka	8	0.65	0.37	0.13	0.35	0.23	0.30	5.91
Tajikistan	11	0.73	0.54	0.15	0.27	0.02	0.38	4.91
Tanzania	2	0.82	0.16	0.57	0.22	0.00	0.26	7.00
Togo	2	0.72	0.02	0.68	0.28	0.08	0.05	6.71
Tonga	1	0.78	0.62	0.11	0.22	.	0.50	2.00
Tunisia	1	0.76	0.72	0.00	0.24	0.04	0.32	6.60
Turkey	1	0.36	0.16	0.13	0.64	0.27	0.36	5.50
Uganda	1	0.70	0.53	0.10	0.30	0.08	0.00	3.00
Ukraine	1	0.46	0.54	0.00	0.54	0.00	0.00	3.00
Uzbekistan	2	0.77	0.21	0.52	0.22	0.00	0.12	7.17
Vietnam	2	0.34	0.11	0.25	0.55	0.11	0.47	4.38
Zambia	2	0.40	0.23	0.01	0.60	0.00	0.26	5.67
Sample Mean		0.68	0.44	0.19	0.31	0.06	0.30	6.97

6.2. Univariate results

In running a multivariate regression analysis, there is always the danger of multicollinearity in such settings. In regression, "multicollinearity" refers to explanatory variables that are correlated with other explanatory variables. It occurs when there is a perfect linear relationship between two or more explanatory variables. In other words, multicollinearity arises when a model has factors that are a bit redundant. It overinflates the standard error of coefficients, which results in making some explanatory variables statistically insignificant when they should naturally be significant (Wooldridge, 2010). One way to measure multicollinearity is the Pearson correlation matrix. We run a correlation analysis among all our explanatory variables. As a rule of thumb, Kennedy (2008) puts a correlation value of 0.8 or higher as an absolute value, that shows a clear case of multicollinearity issue. None of our variables reported in (Table 6.3) reaches this level. The highest level is found between Board size and ln (Size) (0.25). Since the remaining correlations are relatively low, our explanatory variables are considered independent from each other on a satisfactory level.

Another way to measure multicollinearity is the variance inflation factor (VIF). Variance inflation factor measures the degree of variance of an estimated regression coefficient. The coefficient rises if the models predictors are correlated (Wooldridge, 2010). The VIF will be 1 if no factors are correlated. A VIF above 5 indicates high correlation that may be problematic. The evaluation of all our explanatory variables show a variance inflation factor (VIF) below 5. The average is 1.28, whereas the minimum and maximum are 1.02 and 1.77 respectively. This result is in line with Tchuigoua, (2014) who find similar values. This indicates that our explanatory variables may be run independently.

Table 6.3
Pearson correlation matrix between all explanatory variables

	1	2	3	4	5	6	7	8	9
D_female directors	1.00								
ROA	-0.07	1.00							
Board size	0.19	-0.03	1.00						
Size	-0.08	0.11	0.25	1.00					
Age	0.14	0.14	0.21	0.25	1.00				
Risk	0.02	0.00	0.02	0.04	0.02	1.00			
Regulation	-0.08	-0.03	0.09	0.24	-0.10	0.00	1.00		
GDP	-0.03	-0.03	0.02	0.05	-0.12	-0.07	0.12	1.00	
HDI	0.00	0.12	-0.15	0.09	0.14	0.01	-0.18	-0.02	1.00

6.2.1. MFIs with female directors: are they different?

In Table 6.4, we compare the means of various MFIs characteristics across firm-years in which MFIs have at least one female director on the board and firm-years without female directors for our sample of complete data. The comparison shows that, in years in which MFIs have female directors on their boards, they have larger board size, have worst performance in terms of ROA and are smaller in terms of MFI size. MFIs that are more matured have one or more female directors on their boards. These comparisons suggest that MFIs choices to include female directors could be influenced by MFI characteristics. Hence, it is very important to control for these MFI characteristics in our analysis.

Table 6.4
Comparisons of MFIs with female directors and those without

MFI characteristics	Mean for MFIs without female directors	Mean for MFIs with female directors	Difference
ROA	0.03	0.02	0.011***
Board Size	1.67	1.88	-0.216***
Size	16.75	16.40	0.351***
Age	2.59	2.78	-0.19***

This table shows comparisons of means of MFI-level characteristics for years in which MFI's have female directors and MFI-years without female directors, for the sample. *** indicates significance level at 1%.

Figure 6.1. Percentage of female directors on board.

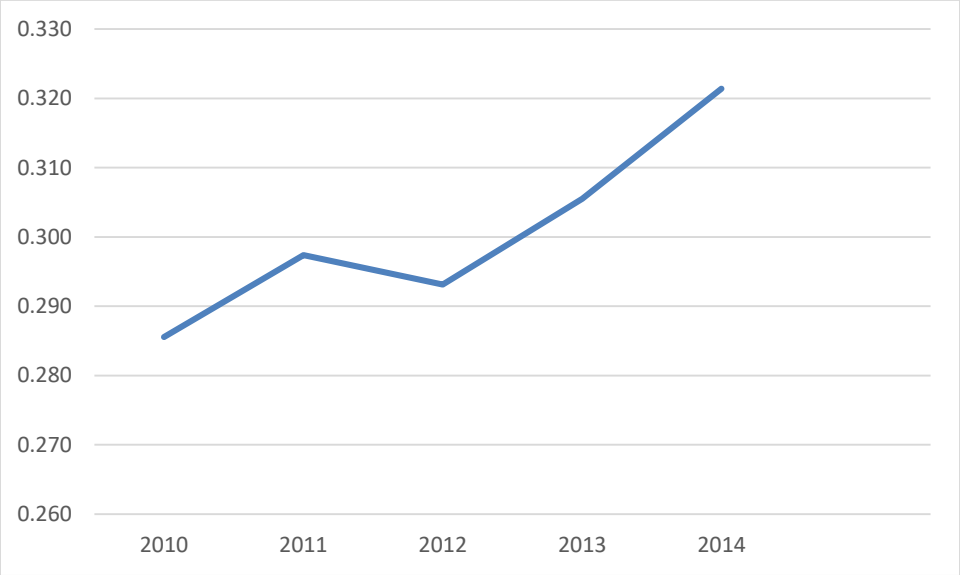
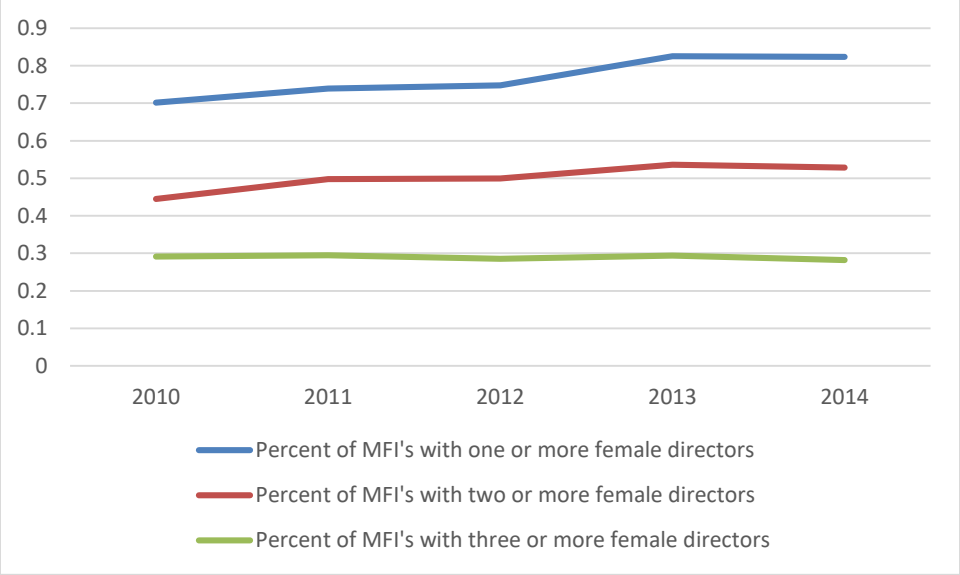


Figure 6.2. Percentage of MFIs with female directors



Figures 6.1 and 6.2 illustrate the trend of female director's board representation from 2010 to 2014. Figure 6.1 shows that the percentage of female directors on board gradually rises from an average of 28% in 2010 to 32% in 2014. Figure 6.2 exhibits the following trend over time. (1) The percentage of MFIs with one or more female directors increases from 70% in 2010 to 82% in 2014. (2) The percentage of MFIs with two or more female directors increases from 44% in 2010 to 52% in 2014. (3) The percentage of MFIs with three or more female directors does not change much, hovering around 29%, suggesting that reaching the critical mass on a board over a sample period is not easy.

6.3. Multivariate results

The relationship between female board of directors and capital structure of MFIs is first examined by controlling for regional and year fixed effects. Pooled ordinary least square estimations is used for each capital structure variables (leverage, borrowing, deposits, equity and donated equity), and the results is presented in Table 6.5 panel A below. The OLS model controls for MFI level characteristics and country specifics variables. The results of the ordinary least square regression show that female director variable is positively and significantly related to leverage. After decomposing leverage into borrowing and deposit, a significant positive relationship between borrowing and female director was observed. Consistent with the findings of Alvez et al. (2015) that gender diversified boards of directors to be more efficient and to contribute to lower information asymmetries and increase the firms proportion of risky securities on its capital structure, in this case leverage and borrowings. We also find no association between female director variable and deposits.

In the equity model, the coefficient on the female director is negative and statistically significant at the 1% level, confirming the arguments that female directors are likely to hold less risky assets. Contrary to our expectations, there is no significant relationship between female directors and subsidized. The coefficients on the control variables are generally consistent with expectations. Profitability measured as ROA is negatively related to leverage and borrowing. This is consistent with pecking order hypothesis developed by Mayers and Majluf (1984), which states that firms tend to go for internal source of funding first followed by external source of funding. However, ROA show a consistent positive relationship with equity, suggesting that profitable MFIs tend to attract more equity investors. The chapter also finds negative relationship between ROA and subsidies. This makes sense because. Donor agencies in most cases fund non-profit oriented MFIs

such as NGO's, hence the negative relationship between profitable MFIs and subsidised funding. Furthermore, a single increase in board size reduces MFIs borrowing by 8% while on the other hand increases deposits by 11%. This means MFIs with larger boards have less long-term liabilities and more short-term liabilities.

The size of MFI is positively and significantly related to leverage, borrowing and deposits. The most reasonable arguments that explain such relationship is the bankruptcy cost hypothesis (Rajan and Zingales, 1995). In this case, large MFIs have low bankruptcy cost and in principle have more diversified portfolio and products with less probability of bankruptcy than smaller MFIs. There is a significant negative relationship between MFIs size and both equity and subsidised equity. This is expected as smaller MFIs are associated with information asymmetry problems and are the main target of donor agencies. One of the important country effects is regulation. The chapter finds a significant positive relationship between regulation and both leverage and deposits. Regulation in this sense helps to protect depositors and restrict MFIs from excessive borrowing. The chapter also observes a significant negative relationship with borrowing, equity and subsidies. This is expected because regulated MFIs tend to diversify their funding choices and thus reduce their dependence on subsidies and grants. The results of other country effects are neither surprising in view of other capital structure evidences.

Table 6.5 panel B represent the random-effect regression with capital structure variables as dependent variables and the female director as independent variables and also include control variables and both regional and time dummies. The results show the overall statistics are satisfactory, with high Wald chi-square statistics throughout. Contrary to our expectations concerning the relationship between female director and capital structure, the results show that female director is only significant in deposit model. The remaining capital structure variables

(leverage, borrowing, equity, subsidies) are not significant, but their coefficients are in the same direction.

A number of the control variables have interesting implications, and are generally in line with the OLS regression above. MFI size is highly significant in all regressions, attracting more leverage comprising of borrowing and deposit, and reducing equity and donated subsidized funding. Board size is likewise highly significant. Larger board attracts more deposits and less of borrowing and equity. Similarly, prudential regulations are highly significant in all five-capital structure variables. Regulations tend to have negative impact on borrowing, equity and subsidies, but have strong positive impact on deposits. These findings indicate that our control variables are highly relevant in this study.

Table 6.5

Capital structure measures and female directors

	Panel A: ordinary least squares					Panel B: Random-effect estimation				
Variables	LEV	BORR	DEP	EQUI	SUBS	LEV	BORR	DEP	EQUI	SUBS
D_female director	**0.049*** **	**0.056*** **	**-0.005**	**-0.048*** **	**0.005**	**0.013**	**0.004**	**0.010***	**-0.012**	**0.012**
	(3.84)	**(3.61)**	**(-0.33)**	**(-3.83)**	**(0.61)**	**(1.07)**	**(0.28)**	**(1.71)**	**(-0.99)**	**(1.36)**
MFI controls										
ROA	-0.423**	-0.303**	-0.031	0.422**	-0.262**	-0.234	-0.198	0.201	0.226	-0.284
	(-2.47)	(-1.98)	(-0.37)	(2.49)	(-2.48)	(-1.32)	(-0.90)	(0.68)	(1.32)	(-1.64)
Board size	0.013	-0.084***	0.110***	-0.009	-0.005	0.032**	-0.027**	0.022***	-0.024*	-0.002
	(1.05)	(-5.85)	(8.13)	(-0.75)	(-0.52)	(2.17)	(-2.20)	(3.56)	(-1.85)	(-0.21)
Size	0.035***	0.009**	0.027***	-0.034***	-0.015***	0.031***	0.011**	0.013***	-0.033***	-0.010***
	(11.03)	(2.45)	(7.91)	(-11.35)	(-6.92)	(4.94)	(1.99)	(4.13)	(-5.09)	(-3.76)
Age	0.004	-0.011	0.014	-0.002	-0.021*	0.007	-0.018	-0.009	-0.003	0.013
	(0.21)	(-0.62)	(0.88)	(-0.16)	(-1.88)	(0.43)	(-1.32)	(-1.51)	(-0.24)	(0.72)
Risk	0.006	-0.015	-0.067	0.005	0.015	0.038	0.018	-0.022	-0.041	0.012
	(0.08)	(-0.19)	(-1.38)	(0.07)	(0.54)	(0.88)	(0.38)	(-1.05)	(-1.08)	(0.56)
Country controls										
Regulation	0.071***	-0.150***	0.247***	-0.080***	-0.036***	0.061***	-0.15***	0.242***	-0.07***	-0.04***
	(5.39)	(-9.78)	(18.46)	(-6.33)	(-3.38)	(2.66)	(-5.80)	(10.50)	(-3.00)	(-2.70)
GDP	0.434**	0.086	0.194	-0.456**	-0.352*	0.086	0.133	0.146**	-0.069	-0.196
	(2.01)	(0.31)	(0.79)	(-2.15)	(-1.67)	(0.68)	(0.81)	(2.18)	(-0.58)	(-0.78)
HDI	-0.050	-0.272**	0.275**	0.040	-0.035	-0.136	-0.145	-0.267*	0.145	-0.063
	(-0.51)	(-2.31)	(2.31)	(0.42)	(-0.46)	(-0.90)	(-0.82)	(-1.91)	(0.99)	(-0.51)
CONSTANT	-0.111	0.752***	-0.952***	1.089***	0.509***	0.031	0.551***	-0.055	0.980***	0.436***
	(-1.15)	(6.75)	(-7.83)	(11.69)	(6.63)	(0.19)	(3.27)	(-0.34)	(6.07)	(4.02)
Obs	1637	1662	1605	1679	1216	1637	1662	1605	1679	1216
Adjusted R^2	0.209	0.199	0.400	0.218	0.154	0.196	0.180	0.355	0.205	0.140

The sample consists of 584 MFI's during the 2010-2014 periods. The dependent variables are Leverage, Borrowings, Deposits, Equity and Donated Equity. All other variables are defined in Table 2.1. The table reports ordinary least squares (OLS) and random effect estimation of capital structure measures on female director variable and control variables. Standard errors are clustered at the country level in order to account for heteroscedasticity. All models include year dummy and regional dummy. Adjusted R^2values are reported in the estimates. The Wald Chi^2 for random effect estimation is reported as well. ***, **, * indicate the coefficient estimates are significantly from zero at the 1%, 5% and 10% levels.

6.3.1. Matching female directors with MFI characteristics

The chapter addresses the issue of endogeneity using the instrumental variable procedure as outlined in Chapter 5 above. In the first-step, the hypothesis that female director is an important element on MFIs social mission is tested. This involves factors such as MFI bias towards female managers and female borrowers, but also MFIs legal status and average loan size. The chapter uses a straightforward probit regression for dummy female director ≥1 and dummy female director ≥3, and OLS regression for the fraction of female director and number of female director.

Table 6.6 shows that female directors are more likely in MFIs with gender bias towards female managers in all the four definitions of female directors. It is remarkable that MFIs with female borrowers are more likely to have female directors as well. Gender bias is significant in three out of four definitions of female directors. This is quite consistent with the matching trait hypothesis in Beckers (1973), where female directors are expected to match with female employees. This is in line with recent evidence provided by Flabbi et al (2014) that female directors could be better positioned to match workers to task and serve consumer markets that are dominated by women.

MFIs legal status, that is, Bank, Cooperative, NGO, Other are significant as well except for Rural bank and NBFI. Female directors are more likely in older MFIs. However, female is less likely when MFIs are larger. Moreover, female borrowers, bank, cooperative, NGO and other are significant for at least two out of the four categories of female director definition. Therefore, the choice of social mission and legal status are important variables of understanding female membership in boards. The instrument we generate can therefore be used in our capital structure regressions.

Table 6.6
Female directors and MFI characteristics

Variables	*D_female director*	*% Female director*	*# female director*	*D_female director≥3*
Gender Bias and Social mission				
Female Managers	0.806***	0.188***	1.439***	0.363***
	(4.74)	(7.39)	(5.76)	(2.8)
Female borrowers	-0.083	0.102***	1.235***	0.519***
	(-0.41)	(3.3)	(4.07)	(2.69)
Loan balance/GNI	-0.217**	-0.009	-0.308***	-0.179**
	(-2.6)	(-0.76)	(-3.11)	(-2.13)
Institutional Variables				
Regulation	-0.080	0.002	0.224	-0.098
	(-0.77)	(0.1)	(1.55)	(-1.05)
Bank	-0.004	0.014	1.176***	1.369***
	(-0.01)	(0.15)	(3.42)	(3.3)
Cooperatives	0.327	0.012	2.349***	1.812***
	(0.77)	(0.13)	(6.98)	(4.41)
NBFI	-0.077	-0.050	0.340	0.682*
	(-0.19)	(-0.57)	(1.26)	(1.7)
NGO	-0.030	-0.008	0.954***	1.121***
	(-0.07)	(-0.09)	(3.16)	(2.76)
Rural Bank	0.149	-0.067	-0.169	0.193
	(0.3)	(-0.74)	(-0.5)	(0.39)
Other	0.084	0.127	1.621***	1.381***
	(0.15)	(1.21)	(3.15)	(2.97)
MFI/country controls				
ln(Size)	-0.044*	-0.015***	0.004	-0.019
	(-1.73)	(-3.64)	(0.12)	(-0.82)
Age	0.460***	0.063***	0.581***	0.384***
	(6.31)	(5.28)	(6.48)	(4.96)
Risk	-0.012	-0.032	0.297	0.375
	(-0.03)	(-0.64)	(0.67)	(1.02)
HDI	-1.573***	0.051	-1.813***	-0.685
	(-2.55)	(0.6)	(-2.63)	(-1.34)
CONSTANT	1.287**	0.238**	-0.517	-2.229***
	(1.89)	(2.08)	(-0.73)	(-3.51)
Obs	1500	1500	1533	1563
Pseudo R^2	0.073**	0.1225***	0.1667***	0.101
Wald x^2*/F-stat*	98.13***	14.31***	20.1***	191.5***
Method	Probit	OLS	OLS	Probit

We analyse the characteristics that are associated with various definition of female directorship (dummy for female director>1, percentage of female directors, number of female directors and a dummy for female directors > 3) by means of pooled probit and pooled ordinary least squares regression. ***, **, * indicate the coefficient estimates are significantly from zero at the 1%, 5% and 10% levels.

6.3.2. Female directors and capital structure

Table 6.7 shows the results when we use the Heckman (1978) two-stage treatment effect procedure that includes the Inverse Mill ratio for all the five different capital structure measures. The Wald chi-square test indicates that we cannot leave all explanatory variables out of our regression specifications. The Inverse Mill's ratio denoted as *Lambda* is not significant in any of the regressions except in the borrowing model at 10% significant level, The Inverse Mills ratio tells us that our estimations does not suffer from any sample selection bias. The results in both sections show that the correction for self-selection bias does not significantly alter our earlier results as the sign of the coefficients are almost similar, but the significant results are fewer in this case.

Results for the Heckman (1978) approach in Table 6.7 shows that female director on MFIs board are not significantly related with leverage. Although the sign of the coefficient is positive, the result is consistent with the findings of Matsa and Miller (2013) who find no change in firm leverage after the introduction of female boardroom representation quota system in Norway. This means that risk aversion may not be a distinctive part of women approach to corporate decision making. By contrast, Berger et al (2014) find that an increase in the proportion female bank directors result in increased portfolio risk.

After splitting leverage into borrowings and deposits, findings suggest that female board of directors have positive but not statistically significant relationship with borrowing. We find a significant positive relationship between female directors and deposits. This result is consistent with earlier result in Table 6.5. With this result, we can forward the argument that female directors attract more deposits to MFIs due to the better match between female leadership and its female clients. Lending credence to matching or sorting argument proposed in Becker's (1973) model for marriage market. Becker gave several examples of matching such as the "*optimal sorting of more informed customers and more honest shopkeepers*". For instance,

Ghatak (2000) applies Becker's model in microfinance settings and show how good borrowers are matched in a group lending scheme. This finding helps improve our understanding on the match between female directors and MFI clients.

The study also finds that female directors are not significantly associated with equity capital, but the coefficients are negative and consistent with previous results in Table 6.5. Thus, it is observed that female directors are significantly and positively related to subsidies at 10% significant level. MFIs that have one or more female directors on board are having 1% increase in subsidised funding than those without. This result is consistent with Pfeffer and Salancik (1978) argument that board of directors seek to link organizations to the most beneficial resources in their external environment. The finding supports such arguments in the sense that female directors seem to play a networking role between they MFIs board and other external organizations that provide them with the most beneficial resources source of funding in the microfinance sector, in this case subsidies.

The results on the control variables are consistent with previous findings that suggest firms with larger boards tend to be more leveraged (Jensen, 1986; Wen et al., 2002; and Alvez et al., 2015). Furthermore, board size is not associated with subsidies. Larger boards are associated with high deposits and less equity. Another important MFI-level control variable is the ROA. The result suggests that there is no relationship between ROA and all the capital structure measures. However, the sign of the coefficients is similar with previous results.

Table 6.7

Results of a two-stage regressions on female directors and capital structure

Variables	LEV	BORR	DEP	EQUI	SUBS
D_female director	0.017	0.001	0.016**	-0.014	0.013*
	(1.28)	(0.09)	(2.49)	(-1.11)	(1.69)
MFI controls					
ROA	-0.309	-0.271	0.019	0.310	-0.282
	(-1.52)	(-1.07)	(0.56)	(1.55)	(-1.36)
Board size	0.034**	-0.021	0.019***	-0.031**	-0.008
	(2.36)	(-1.62)	(2.88)	(-2.24)	(-0.80)
Size	0.034***	0.008	0.017***	-0.035***	-0.012***
	(4.77)	(1.17)	(4.71)	(-4.66)	(-3.58)
Age	-0.010	0.029	-0.012	-0.007	0.002
	(-0.50)	(1.36)	(-1.20)	(-0.44)	(0.15)
Risk	0.007	0.009	-0.061**	0.001	0.001
	(0.13)	(0.14)	(-2.44)	(0.02)	(0.02)
County controls					
Regulation	0.063***	-0.152***	0.238***	-0.068***	-0.038**
	(2.67)	(-5.63)	(10.45)	(-2.91)	(-2.33)
GDP	0.038	0.144	0.105	-0.041	-0.214
	(0.28)	(0.78)	(1.42)	(-0.32)	(-0.72)
HDI	-0.089	-0.214	-0.181	0.080	-0.061
	(-0.58)	(-1.15)	(-1.26)	(0.53)	(-0.50)
Lambda	-0.134	0.411*	-0.023	0.030	0.049
	(-0.63)	(1.72)	(-0.23)	(0.14)	(0.32)
CONSTANT	0.284*	0.445*	-0.154	0.780***	0.244**
	(1.72)	(1.71)	(-0.91)	(4.86)	(1.99)
Regional Dummies	Included	Included	Included	Included	Included
Time Dummies	Included	Included	Included	Included	Included
Obs	1423	1448	1400	1457	1071
Adjusted R^2	0.202	0.193	0.358	0.214	0.155
Wald x^2	135.10***	159.42***	327.62***	158.76***	94.34***

Instruments: fitted probabilities from a probit explaining binary variable for female director. Capital structure in terms of Leverage, Borrowings, Deposits, Equity, subsidies regressed on female directorship, MFI and country controls using IV. As instruments, fitted probabilities from probit analysis explaining the dummy female director have been used in the dummy endogenous variable model of Heckman (1978). Significance levels based on heteroskedastic and autocorrelation-corrected standard errors clustered at the MFI level. ***,**,* indicates that the coefficient estimates are significantly different from zero at 1%, 5%, 10% levels.

Prudential regulations have negative impact on borrowings, equity and subsidies, but has a positive effect on deposits. Being regulated enables, MFIs to diversify their funding choices and thus reduce their dependence on subsidies and grants. The study also finds a significant positive relationship between regulation and both leverage and deposits. Regulation in this sense helps to protect depositors and restrict MFIs from excessive borrowing. The asset size of MFIs is positively and significantly related to leverage and deposits and negatively related to equity and subsidies. This evidence is consistent with previous studies (Rajan and Zingales, 1995), which suggests that larger MFIs with big asset size can easily leverage their assets compared to smaller MFIs with small asset size that mostly depend on grants and subsidies. The country effects are neither surprising in view of other capital structure evidences.

6.4. Robustness check

To test the reliability of our results, we report our robustness check by using different instrumental variables for capital structure regression. In the first robustness test, the study uses different instrumental procedure, where instruments are taken from the significant variables in the matching regressions between female directors and MFI characteristics in Table 6.6. The results are presented in Table 6.8. The signs are everywhere the same as in Table 6.7 except for the findings that female directors are significantly and positively related to MFI leverage and a marginal negative relationship with borrowing. Thus, the result in Table 6.8 may not be robust to the estimation method, hence the marginal inconsistency with results from previous estimation in Table 6.7.

Table 6.8

Instrumental variables capital structure regression with different instruments

Variables	LEV	BORR	DEP	EQUI	SUBS
D_female directors	0.29**	-0.274*	0.10	-0.16	-0.04
	(1.96)	(-1.80)	(1.33)	(-1.55)	(-0.54)
MFI controls					
ROA	-0.224***	-0.331***	0.046	0.268***	-0.305***
	(-2.58)	(-3.90)	(1.13)	(3.93)	(-4.15)
Board Size	0.003	0.021	0.006	-0.012	0.002
	(0.13)	(0.87)	(0.62)	(-0.65)	(0.11)
Size	0.039***	0.010	0.016***	-0.038***	-0.013***
	(6.05)	(1.27)	(4.06)	(-7.17)	(-3.28)
Age	-0.02	0.012	-0.013**	0.000	0.004
	(-1.22)	(0.69)	(-1.96)	(-0.01)	(0.29)
Risk	0.034	-0.003	-0.054**	-0.011	-0.001
	(0.60)	(-0.04)	(-2.08)	(-0.25)	(-0.03)
Country controls					
Regulation	0.076***	-0.168***	0.244***	-0.075***	-0.041***
	(2.74)	(-4.52)	(8.53)	(-3.23)	(-2.66)
GDP	-0.001	0.146	0.094	-0.027	-0.187
	(0.00)	(0.82)	(1.25)	(-0.20)	(-1.10)
HDI	-0.099	-0.055	-0.346***	0.089	-0.070
	(-0.53)	(-0.22)	(-2.01)	(0.57)	(-0.69)
CONSTANT	0.108	0.589**	-0.053	0.855***	0.296**
	(0.49)	(2.10)	(-0.27)	(4.73)	(2.42)
Regional Dummies	Included	Included	Included	Included	Included
Time Dummies	Included	Included	Included	Included	Included
Obs	1423	1448	1400	1457	1071
Adjusted R^2	0.132	0.066	0.326	0.190	0.139
Wald x^2	120.4***	72.55***	228.56***	177.49***	121.12***

Instruments used: Female manager, female borrowers, loan balance/GNI, dummy bank, dummy, cooperative, dummy, NGO, dummy NBFI and dummy others. An instrumental variables approach to determine whether female directors stimulates capital structure. We regress capital structure variables on female directors using 2SLS. For instruments, the variables that have a clear relation with female director according to Table 7 have been used. Significance levels based on heteroskedastic and autocorrelation-corrected standard errors clustered at the MFI level. ***, **, * indicates that the coefficient estimates are significantly different from zero at 1%, 5%, 10% levels.

Secondly, inconsistent results from prior research on female directors motivate us to employ alternative test on various definitions of female director. In particular, the study examines the Konrad et al (2008) critical mass theory hypothesis that suggests the need to have three or more female directors in order to realise their positive impact on corporate boards. This is otherwise known as the magic number. The study implements this with an indicator variable being one if the number of female directors is equal to or more than three. Other important female director measures put to the test are the absolute number of female directors and the fraction of female directors. Table 6.9 report the results.

The study finds a significant positive relationship between two female director specification and leverage, with the one remaining specification having a positive coefficient as well. The critical mass hypothesis is upheld in this instance, with the significant results between three or more female directors and leverage. Meaning to say, female director's risk-taking attitude is more pronounced when MFIs have three or more of them. Contrary to previous findings that a board with higher proportion of female directors is no more or less risk-taking than a more male dominated board (Sila et al., 2016). Similarly, Huang and Kisgen (2013) find analogous results for capital structure decisions. Female executives are less likely to issue debt, and announcement returns for debt offerings are higher when the firm has a female executive. Female executives do not, however, make significantly different changes to leverage overall. Our results in this case is quite contributory because it reveals that more female directors on board partially substitute for weak corporate governance of MFI (Gull et al., 2011), and consequently reduces MFIs agency cost of leverage.

Similarly, the relationship between female directors and borrowings is strongly significant with two specifications and marginally significant with magic number of female directors. This finding

is consistent with previous study by Alvez et al. (2015) that finds female directors to be associated with more debts, that is driven by high monitoring and disclosures which invariably reduces information asymmetry problem. While significant positive relationship exists between deposits and female board of directors in the two main specifications of female directors. There is no relationship between the magic number of female directors in board and deposits. Thus, it is remarkable that female directors have consistent positive relationship with deposits in all the previous regressions.

Furthermore, the study observes a significant negative relationship between equity capital and female directors across all specification except one. When MFIs have three or more female directors, they tend to have 25% less equity capital. Although the result supports the critical mass hypothesis, and it also strengthens our risk aversion argument. There is no relationship between subsidies and all of the female director specifications. However, the coefficient signs remain positive for all the specifications. All other results on MFI and country level effects are consistent with the previous regressions.

Next, the study turns to the possible link between MFIs social performance variables and capital structure of MFIs. Thus, our approach is to find variable that previous literature has not yet considered as an explanatory variable in the capital structure regressions and by their inclusion, it may affect the outcome of the results. One reason that is often provided for the supply of capital to microfinance institutions is their social performance (Mersland and Uregeghe, 2013). Social performance is usually observed using the number of female client served and the size of MFIs loan. We therefore, include female borrowers and loan balance/GNI among the explanatory variables in the capital structure regressions, using the Heckman (1978) dummy endogenous variable method as in Table 6.7. The regressions results are presented in Table 6.10

Table 6.9: Instrumental variables capital structure regressions with different definitions for female director

Variables	*LEV*			*BORR*			*DEP*			*EQUI*			*SUBS*		
% of Female directors	0.091			-0.422***			0.239**			-0.076			0.124		
	(0.71)			(-2.57)			(2.21)			(-0.66)			(1.25)		
# Female directors		0.032*			-0.058***			0.040**			-0.027*			0.003	
		(1.80)			(-2.68)			(2.32)			(-1.71)			(0.30)	
D_female directors>3			0.355**			-0.285*			0.048			-0.254**			0.020
			(2.29)			(-1.68)			(0.51)			(-1.97)			(0.27)
MFI controls															
ROA	-0.312***	-0.303***	-0.273***	-0.274***	-0.255***	-0.188**	0.013	0.005	0.018	0.313***	0.304***	0.290***	-0.278***	-0.301***	-0.252***
	(-4.90)	(-4.59)	(-3.52)	(-3.44)	(-3.21)	(-2.26)	(0.32)	(0.12)	(0.53)	(5.41)	(5.05)	(4.26)	(-4.21)	(-4.64)	(-4.17)
Board Size	0.041***	-0.021	-0.075	-0.026*	0.100**	0.071	0.031***	-0.055*	-0.001	-0.034***	0.018	0.049	-0.009	-0.017	-0.018
	(3.34)	(-0.58)	-1.49	(-1.68)	(2.29)	(1.37)	(3.65)	(-1.70)	(-0.02)	(-3.07)	(0.53)	(1.22)	(-0.83)	(-0.65)	(-0.60)
Size	0.034***	0.040***	0.043***	0.007	0.003	0.013	0.019***	0.021***	0.011***	-0.035***	-0.041***	-0.043***	-0.010**	-0.012***	-0.012***
	(6.63)	(6.70)	(5.42)	(1.02)	(0.38)	(1.42)	(4.84)	(4.39)	(2.86)	(-7.38)	(-7.37)	(-6.38)	(-2.53)	(-3.24)	(-3.21)
Age	-0.001	-0.003	-0.010	0.009	0.017	0.002	-0.013*	-0.019**	-0.010	-0.009	-0.007	-0.004	-0.006	0.003	0.005
	(-0.09)	(-0.21)	(-0.63)	(0.64)	(1.15)	(0.10)	(-1.72)	(-2.26)	(-1.56)	(-0.80)	(-0.68)	(-0.31)	(-0.51)	(0.30)	(0.41)
Risk	0.008	-0.022	-0.028	0.006	-0.007	-0.007	-0.065**	-0.075**	-0.060**	0.002	0.034	0.042	0.006	0.001	0.002
	(0.17)	(-0.45)	(-0.48)	(0.10)	(-0.13)	(-0.12)	(-2.25)	(-2.53)	(-2.62)	(0.05)	(0.78)	(0.89)	(0.14)	(0.03)	(0.04)
Country controls															
Regulation	0.064***	0.059***	0.088***	-0.162***	-0.144***	-0.169***	0.242***	0.233***	0.240***	-0.069***	-0.065***	-0.084***	-0.034**	-0.041***	-0.041***
	(2.96)	(2.68)	(2.87)	(-5.19)	(-4.82)	(-3.64)	(9.88)	(8.16)	(5.42)	(-3.28)	(-2.99)	(-2.85)	(-2.29)	(-3.08)	(-2.82)
GDP	0.042	0.022	-0.136	0.153	0.137	0.147	0.078	0.070	0.109	-0.047	-0.022	0.099	-0.223	-0.235	-0.225
	(0.28)	(0.14)	(-0.70)	(0.86)	(0.77)	(0.77)	(0.91)	(0.81)	(1.43)	(-0.35)	(-0.16)	(0.63)	(-1.34)	(-1.42)	(-1.34)
HDI	-0.081	-0.080	-0.118	-0.192	-0.116	0.014	-0.129	-0.205	-0.605***	0.071	0.067	0.097	-0.049	-0.058	-0.059
	(-0.54)	(-0.52)	(-0.59)	(-0.90)	(-0.57)	(0.05)	(-0.83)	(-1.18)	(-2.86)	(0.49)	(0.45)	(0.50)	(-0.49)	(-0.62)	(-0.62)
Obs	1423	1460	1479	1448	1483	1503	1400	1432	1448	1457	1494	1512	1071	1096	1110
Adjusted R^2	0.196	0.155	0.071	0.114	0.118	0.105	0.348	0.318	0.309	0.210	0.175	0.113	0.123	0.162	0.156
Wald x^2	174.06	167.86	95.77	96.4	97.98	47.83	279.64	211.94	151.27	203.08	197.61	123.97	124.62	139.62	133.94

Instruments used: Female manager, female borrowers, loan balance/GNI, dummy bank, dummy, cooperative, dummy, NGO, dummy NBFI and dummy others. % female director is the fraction of female directors. # female directors are the continuous variable denoting the number of female directors. D_female director>3 and a dummy that is 1 if the MFI has three or more female directors. For instruments, the variables that have clear relation with female director according to Table 6.6 have been used. Significance level are based on heteroscedasticity and autocorrelation-corrected standard errors clustered at the MFI level. ***, **, * indicates that the coefficient estimates are significantly different from zero at 1%, 5%, 10% levels

Table 6.10

Results on MFI capital structure when social performance variables are included

Variables	LEV	BORR	DEP	EQUI	SUBS
D_female directors	0.017	0.004	0.015**	-0.014	0.014*
	(1.24)	(0.26)	(2.37)	(-1.09)	(1.76)
MFI controls					
ROA	-0.306	-0.279	0.020	0.309	-0.285
	(-1.51)	(-1.11)	(0.58)	(1.55)	(-1.37)
Board size	0.037**	-0.023*	0.021***	-0.031**	-0.007
	(2.35)	(-1.76)	(3.19)	(-2.25)	(-0.76)
Size	0.033***	0.009	0.016***	-0.034***	-0.012***
	(4.69)	(1.39)	(4.46)	(-4.58)	(-3.57)
Age	-0.024	0.048***	-0.028***	0.005	0.010
	(-1.15)	(2.17)	(-2.77)	(0.30)	(0.55)
Risk	0.004	0.012	-0.064**	0.002	0.002
	(0.09)	(0.18)	(-2.49)	(0.05)	(0.06)
Social performance variables					
Female borrowers	-0.005	0.099**	-0.004	-0.015	0.004
	(-0.14)	(2.08)	(-0.16)	(-0.45)	(0.14)
Loan bal/GNI	0.036**	-0.045**	0.048***	-0.036***	-0.019**
	(2.39)	(-2.27)	(4.84)	(-2.68)	(-2.10)
Country controls					
Regulation	0.058**	-0.139***	0.232***	-0.065***	-0.036**
	(2.48)	(-5.15)	(10.70)	(-2.80)	(-2.10)
GDP	0.030	0.150	0.092	-0.030	-0.211
	(0.22)	(0.80)	(1.21)	(-0.23)	(-0.71)
HDI	0.014	-0.335*	-0.016	-0.026	-0.115
	(0.09)	(-1.70)	(-0.11)	(-0.16)	(-0.93)
CONSTANT	0.319*	0.338	-0.139	0.765***	0.223*
	(1.92)	(1.24)	(-0.85)	(4.76)	(1.78)
Regional Dummies	Included	Included	Included	Included	Included
Time Dummies	Included	Included	Included	Included	Included
Obs	1423	1448	1400	1457	1071
Adjusted R^2	0.213	0.219	0.400	0.224	0.157
Wald x^2	148.93	193.56	381.23	178.26	98.43

Instruments: fitted probabilities from a probit explaining binary variable of female director. The Heckman (1978) dummy endogenous model is used in estimations. Significance levels are based on heteroskedastic and autocorrelation-corrected standard errors. ***, **, * indicates that the coefficient estimates are significantly different from zero at 1%, 5%, 10% levels.

The study finds significant positive relationship between female director variable and deposits. We find only weak relationship in the subsidies regression. This means that our results from Table 6.7 is upheld and that we do not risk much in not including social performance variables in our main capital structure regression in Table 6.7.

Furthermore, theoretical and empirical literatures suggest that the causality between the choice of financing and performance runs from both direction (Berger and di Patti, 2006). It is important to account for this potential endogeneity issue in our model. Therefore, we propose to consider lagged values of our measures of financial performance and social performance separately. In particular, the study considers a one-year lag for Return on Assets (l_ROA), Percentage of female borrowers (l_female borrowers) and loan balance divided by GNI (l_loan bal/GNI). The basic assumption is that MFIs choice of financing may be endogenously determined by previous year's performances (financial and social). Tables 6.11 and 6.12 show the Heckman results with lag values for financial performance and social performance respectively. The Heckman results are very similar to the ones without lagged values presented in previous tables. The signs of the coefficients are almost similar across all models depending on the significance level.

The study observes significant positive relationship between female director variable and both leverage and deposits. It also finds a significant negative relationship between female director variable and equity capital. This comes as no surprise because the inclusion of lagged ROA values controls for the endogeneity associated with performance variables, hence the strong significant relationships. Similar results were reported when lagged values for social performance variables are included in Table 6.12. Only that the study observes a weak relationship at 10% significant level for both leverage and equity. However, we still find less than 1% significance level in the

deposit model. These results support the specifications used here, by treating the lagged values of financial and social performance variables in separate estimations.

Table 6.11
Results on female directors and capital structure including lagged financial performance variable

Variables	LEV	BORR	DEP	EQUI	SUBS
D_female directors	0.031**	0.008	0.024***	-0.030**	0.008
	(2.18)	(0.48)	(3.20)	(-2.33)	(0.72)
Lagged financial performance					
L_ROA	-0.312***	-0.325***	0.029	0.317***	-0.142**
	(-4.18)	(-3.70)	(0.66)	(4.66)	(-2.20)
MFI controls					
Board size	0.030**	-0.029*	0.021***	-0.023*	-0.002
	(2.20)	(-1.83)	(2.76)	(-1.84)	(-0.22)
Size	0.033***	0.001	0.017***	-0.035***	-0.010***
	(6.10)	(0.15)	(4.49)	(-6.80)	(-2.70)
Age	0.002	0.037	-0.004	-0.008	0.011
	(0.08)	(1.55)	(-0.33)	(-0.42)	(0.69)
Risk	-0.027	-0.029	-0.038	0.030	-0.019
	(-0.49)	(-0.45)	(-1.36)	(0.61)	(-0.41)
Country controls					
Regulation	0.070***	-0.139***	0.241***	-0.071***	-0.023
	(3.05)	(-5.27)	(10.13)	(-3.16)	(-1.56)
GDP	0.071	0.171	0.156*	-0.017	-0.396**
	(0.41)	(0.83)	(1.78)	(-0.11)	(-2.52)
HDI	-0.157	-0.249	0.195	0.128	-0.003
	(-1.01)	(-1.39)	(1.43)	(0.85)	(-0.03)
CONSTANT	-0.004	0.486**	-0.576***	1.057***	0.388***
	(-0.02)	(2.55)	(-4.58)	(6.78)	(3.25)
Regional Dummies	Included	Included	Included	Included	Included
Obs	1069	1072	1022	1079	857
Adjusted R^2	0.201	0.186	0.367	0.212	0.125
Wald x^2	143.63	118.85	279.58	160.51	56.55

We regress capital structure variables on lagged financial performance and control variables. The capital structure variables are leverage, borrowing, deposits, equity and subsidies. The Heckman (1978) model is used in estimations. Significance levels are based on heteroskedastic and autocorrelation-corrected standard errors. ***, **, * indicates that the coefficient estimates are significantly different from zero at 1%, 5%, 10% levels.

Table 6.12

Results on female directors and capital structure including lagged social performance variables

Variables	LEV	BORR	DEP	EQUI	SUBS
D_female directors	0.029*	0.003	0.031***	-0.027*	0.016
	(1.86)	(0.16)	(3.92)	(-1.94)	(1.32)
Lagged social performance					
L_Female borrowers	-0.009	0.161***	-0.078**	0.000	0.069**
	(-0.20)	(3.03)	(-2.36)	(0.01)	(2.05)
L_loan bal/GNI	0.055***	-0.040*	0.051***	-0.051***	0.012
	(2.69)	(-1.76)	(3.99)	(-2.69)	(0.81)
MFI controls					
Board size	0.031**	-0.030*	0.023***	-0.025*	0.002
	(2.14)	(-1.86)	(2.98)	(-1.95)	(0.16)
Size	0.027***	0.000	0.015***	-0.029***	-0.011***
	(4.82)	(-0.01)	(3.69)	(-5.40)	(-2.78)
Age	-0.011	0.052**	-0.006	0.004	0.014
	(-0.51)	(2.06)	(-0.50)	(0.20)	(0.74)
Risk	-0.020	-0.006	-0.053*	0.018	0.005
	(-0.36)	(-0.09)	(-1.82)	(0.36)	(0.10)
Country controls					
Regulation	0.068***	-0.121***	0.236***	-0.068***	-0.031*
	(2.90)	(-4.57)	(10.23)	(-2.99)	(-1.90)
GDP	0.097	0.172	0.145	-0.051	-0.443***
	(0.52)	(0.80)	(1.54)	(-0.31)	-2.61
HDI	0.026	-0.338*	0.303**	-0.048	0.016
	(0.16)	(-1.79)	(2.22)	(-0.30)	(0.13)
CONSTANT	0.020	0.266	-0.520***	1.041***	0.307**
	(0.11)	(1.33)	(-4.01)	(6.25)	(2.36)
Regional Dummies	Included	Included	Included	Included	Included
Obs	1007	1019	966	1023	815
Adjusted R^2	0.202	0.206	0.419	0.208	0.107
Wald x^2	123.40	116.43	312.22	133.94	56.86

We regress capital structure variables on lagged social performance and control variables. The capital structure variables are leverage, borrowing, deposits, equity and subsidies. The Heckman (1978) model is used in estimations. Significance levels are based on heteroskedastic and autocorrelation-corrected standard errors. ***, **, * indicates that the coefficient estimates are significantly different from zero at 1%, 5%, 10% levels.

The causal relationships in the robustness test have similar direction with the main results in Table 6.7. However, the results of the robustness test using various specifications of female directors (Table 6.9) and those that considered lagged values, (Tables 6.11 and 6.12) are more significant. The reason is that, the matching variables used as instruments in Table 6.9 may have rightly corrected for endogeneity, hence the significant findings. Meanwhile the lagged values used in Tables 6.11 and 6.12 may as well purged the estimates with endogeneity, that is, it has eliminated the correlation between explanatory variables and the error term. This may lead to the significant results. The overall conclusion of the robustness check using different specifications confirms the results of the two-stage treatment effect. Thus, the conclusion from the two-step endogenous variable method in Table 6.7 is upheld. That is, Female directors are found to have significant impact on deposits and subsidies. More specifically, it is evident that MFIs with three or more female directors on boards are associated with less agency cost, which results in more leverage. This contributory work may seek to provide answers to our research questions.

6.5. Literature summary

Female directors in microfinance have been attributed to increase in financial performance (Mersland and Strom, 2009; Strom et al., 2014). However, these studies are restricted to MFIs performance models. Similarly studies on MFIs funding models fail to address the pertinent role of board gender diversity on MFIs capital structure (Bogan, 2012; Tchuigoua, 2014). This study finds a significant link between board gender diversity and MFIs capital structure, thereby contributing to the general microfinance literature.

Several empirical studies have analysed the influence of board of directors on firm's external resources. The resource dependency theory argues that board of directors seeks to link organization to other external organization in order to address environmental dependencies (Pfeffer and

Salancik, 1978). This argument is supported by several studies that find significant evidence between board member representing financial institutions and leverage (Pfeffer, 1972), commercial bankers on board with short term and long term bank debt (Booth and Deli, 1999), and politically connected outside directors with sales to government (Agrawal and Knoeber, 2001). There are studies on gender diversified boards that provide the basis for some of the most convincing argument on resource dependency theory. For instance, Siciliano (1996) did not find a link between female directors and external resources (fundraising goal) of firms. However, on the contrary, Hillman et al (2007) find that female representation on board is always related to linkages with female directors in other boards. In sum the theory point to the beneficial linkages of female led MFI's to resources in its surrounding.

Another line of research focused on the risk attitude of female directors towards firm financing choices. Jianakoplos and Bernasek (1998), Adams and Ferreira (2004) and Jacobsen et al., (2014) are good examples of this line of research. These studies find that the presence of female directors on boardrooms are viewed as a means of reducing firm access to risky securities. Some studies find no such evidence, Matsa and Miller (2013) find no change in firm leverage after the introduction of a female board representation quota in Norway. The authors posit that risk aversion may not be a distinctive part of women approach to corporate decision making. A board with a higher proportion of female directors is no more or less risk-taking than a more male dominated board (Sila et al., 2016). Huang and Kisgen (2013) find that female executives do not make any significant changes to firm's overall leverage. By contrast, Berger et al (2014) find that an increase in the proportion female bank directors result in increased portfolio risk. Based on this conflicting evidences, it is unclear whether higher female directors on boards mean less MFIs risk-taking or not.

Similarly, evidence from corporate boards suggest that female directors can affect governance quality. Carter et al. (2010) show that gender diversified boards can improve its monitoring efficiency. Adams and Ferreira (2009) document that female directors attend more board meetings, which is an important information gathering mechanism. In a similar view, Gul et al (2008) and Alvez et al (2015) show that firms with more female directors have high monitoring, greater level of public disclosure and better managerial accountability. However, Adams and Ferreira, (2009) argue that in a well governed firms, female directors can negatively affect firm value due to excessive over-monitoring Gull et al., (2011) and Strom et al., (2014) argue on the contrary that firms can remedy their weak governance by having high female directors on board. These conflicting evidences provides the basis for this study.

6.6. Contributions of the study

Two main conclusions emerge from the investigation. The results offer supportive evidence that female directors have an impact on the capital structure of microfinance institutions. This result is the first of its kind in the microfinance literature. First, the study observe that female directors increases MFIs deposit financing. It shows a significant positive relationship between female director and deposits. This finding support the matching traits hypothesis, where female directors tend to attract more deposits due to the better match with its female clients.

The study also finds that the mere presence of female directors on MFI board increases access to subsidies. The study observes a marginal relationship between female directors and subsidies. This result contributes to the resource dependence argument by Pfeffer and Salanciks, (1978) that female board of directors seek linkages with the most beneficial resources in their environment. The finding supports such arguments in the sense that female board of directors seems to play a

networking role between the MFI they represent and organizations that provide them with the most beneficial source of funding, in this case donor agencies.

The second main conclusion confirms the findings of Kramer et al., (2007) and Konrad et al., (2008) that having three or more female directors on board can create a critical mass where female directors can influence the content and process of board decisions. When a critical mass or three or more female directors is reached, MFIs tend to leverage more. This is contributory evidence that the risk-taking attitude among female directors is more pronounced when MFIs have three or more of them on board. It also suggests that more female directors on board is associated with increase in monitoring and disclosures which reduces MFIs agency cost of leverage.

6.7. Summary

This chapter examines the role of female directors on microfinance institutions capital structure decision. The study aims to answer the question of whether female directors as in (Strom et al., 2014) have any impact on MFIs capital structure as in (Tchuigoua, 2014). The chapter treats possible endogeneity issue using the Heckman endogenous variable method and the inverse mills ratio (IMR). The chapter considered different instrumental variable method and considered lagging some variables that has not been done in microfinance studies before. The contrasting results from the regression specifications are due to the endogeneity problems. The capital structure decision of MFIs has perhaps not been settled. The ability of female directors is crucial in this increasingly expanding sector. Empirical evidence suggests that capital structure decision of MFIs is determined by board gender diversity. Therefore, the questions on the role of female directors in determining the capital structure of MFIs remains pertinent.

Chapter 7 - Results II: The impact of firm-specific and institutional-specific factors on MFIs capital structure

7.0. Introduction

This chapter presents empirical evidence on the institutional-specific determinants of MFIs capital structure. In doing so, both leverage and subsidies were separately investigated in all analysis. The impact of Firm-specific on MFIs capital structure was examined for each country in our sample. Particularly, the equality of Firm-specific coefficients across countries was examined. The use of joint test for the equality of coefficient is clearly justified given that prior studies suffer from significant limitations. For example, Tchuigoua (2014), implicitly assumes that the impact of Firm-specific factors on MFIs capital structure are the same across countries as observed in many previous capital structure studies (Booth et al., 2001; Giannetti, 2003; and Fan et al., 2012).

The question of whether institutional-specific determinants have direct and indirect impact on MFIs capital structure was also investigated using the weighted least square regression method. Unlike the previous chapter, this chapter employs only two dependent variables, that is, leverage and subsidies. The chapter contains a final sample of 645 MFIs or 5215 firm year observations. The chapter proceeds as follows: Section 7.1 presents the descriptive statistics of the key variables. Section 7.2 discusses the results of multivariate analyses. The robustness checks are described in Section 7.3. Section 7.5 presents brief discussion on key most recent papers. Contributions of the study is presented in section 7.5. Section 7.6 summarises the chapter.

7.1. Descriptive statistics

Table 7.1 presents mean and median values of capital structure variables and other Firm-specific variables for 56 countries covering the period 2004 to 2014. The mean for leverage in the sample of 56 countries is 67% and the median is 74%. The mean for subsidies is 10% and the median is

3%. This is partly consistent with prior studies on MFIs capital structure. Contratry to the claim that firms in developing countries have low level of leverage (Demirguc-Kunt and Maksimovic 1996; Booth et al., 2001; de Jong et al., 2008), this chapter observes that leverage is high in most of the countries in our sample. Countries like Philiphines have as high as 92% leverage while Palestine show as low as 22%. The chapter also observes that subsidies such as donated equity is low in most countries, however there are exceptional cases like palestine where subsidies are observed at 62%.

In addition, Table 7.1 provides summary statistics of Firm-specific charactersitics per country. For instance, the study observe lower level of tangibility across countries, with highest level of 17% reported in Mozambique. This is expected since MFIs are typically small businesses in nature and most operate in the rural areas. Countries with the high median risk rates include Albania, Palestine, Romania and Rwanda. Countries with high mean value for profitability are Benin, Ghana and Senegal while those countries with lowest and negative values for profitability are Afgahnistan, Albania, Argentina, Chile, Mozambique, Nigeria, Pakistan and Sri Lanka. This chapter also observe that countries with high mean value for liquidity are Afghanistan, Congo and Egypt. Countries with the lowest means values for liquidity include Bosnia and Herzegovina, Colombia, Costa-Rica, Jordan and Tunisia. However, among all Firm-specific variables, the values of profitability exhibits the highest variation while tangibility shows the lowest variation. Similarly, Table 7.2 presents the summary statistics of the institutional-specific determinants.

Table 7.1

Cross-country summary statistics of capital structure variables and other MFI-level variables

Country	LEV	SUBS	TANG	RISK	PROFIT	LIQUID	SIZE	AGE	Obs	% Obs	MFI	% MFI
Afghanistan	0.78	0.51	0.04	0.04	-0.12	0.31	16.09	1.76	50	0.96%	5	0.78%
	(0.86)	(0.23)	(0.02)	(0.01)	(-0.09)	(0.27)	(16.17)	(2.00)				
Albania	0.47	0.21	0.02	0.14	-0.01	0.11	14.74	2.17	18	0.35%	2	0.31%
	(0.36)	(0.02)	(0.02)	(0.10)	(0.01)	(0.10)	(15.63)	(2.00)				
Argentina	0.61	0.01	0.05	0.04	-0.11	0.14	14.25	2.23	65	1.25%	9	1.40%
	(0.71)	(0.00)	(0.02)	(0.04)	(-0.04)	(0.08)	(14.68)	(2.00)				
Armenia	0.61	0.12	0.04	0.02	0.04	0.14	16.15	2.25	69	1.32%	8	1.24%
	(0.70)	(0.00)	(0.03)	(0.01)	(0.04)	(0.11)	(16.09)	(2.00)				
Azerbaijan	0.55	0.18	0.04	0.02	0.06	0.10	15.59	2.33	166	3.18%	22	3.41%
	(0.66)	(0.00)	(0.02)	(0.01)	(0.05)	(0.07)	(15.39)	(3.00)				
Bangladesh	0.81	0.06	0.04	0.06	0.02	0.16	16.77	2.99	158	3.03%	19	2.95%
	(0.84)	(0.01)	(0.03)	(0.04)	(0.01)	(0.13)	(16.74)	(3.00)				
Benin	0.71	0.10	0.09	0.08	0.10	0.13	14.85	2.38	48	0.92%	7	1.09%
	(0.76)	(0.04)	(0.09)	(0.06)	(0.00)	(0.10)	(15.18)	(3.00)				
Bolivia	0.71	0.09	0.03	0.04	0.02	0.13	17.19	2.95	193	3.70%	19	2.95%
	(0.79)	(0.00)	(0.03)	(0.02)	(0.02)	(0.11)	(17.11)	(3.00)				
Bosnia and Herzegovina	0.63	0.12	0.06	0.04	0.03	0.08	16.98	2.72	110	2.11%	11	1.71%
	(0.68)	(0.07)	(0.05)	(0.02)	(0.03)	(0.06)	(17.11)	(3.00)				
Brazil	0.48	0.06	0.02	0.07	0.03	0.16	15.59	2.75	108	2.07%	15	2.33%
	(0.50)	(0.00)	(0.02)	(0.04)	(0.08)	(0.13)	(15.20)	(3.00)				
Bulgaria	0.35	0.23	0.05	0.05	0.01	0.18	14.20	2.71	31	0.59%	4	0.62%
	(0.28)	(0.16)	(0.01)	(0.04)	(0.03)	(0.07)	(14.21)	(3.00)				
Cambodia	0.66	0.07	0.02	0.01	0.03	0.13	16.55	2.69	166	3.18%	18	2.79%
	(0.74)	(0.00)	(0.02)	(0.00)	(0.04)	(0.11)	(16.29)	(3.00)				
Chile	0.42	0.18	0.04	0.07	-0.10	0.13	16.12	3.00	19	0.36%	2	0.31%
	(0.50)	(0.00)	(0.04)	(0.06)	(-0.02)	(0.11)	(16.13)	(3.00)				
Congo	0.49	0.36	0.09	0.07	0.00	0.31	15.55	2.22	36	0.69%	4	0.62%
	(0.57)	(0.28)	(0.06)	(0.03)	(0.00)	(0.31)	(14.91)	(2.00)				
Colombia	0.66	0.05	0.05	0.05	0.04	0.07	17.39	2.78	172	3.30%	22	3.41%
	(0.71)	(0.00)	(0.03)	(0.04)	(0.04)	(0.04)	(17.51)	(3.00)				
Costa Rica	0.60	0.07	0.07	0.08	0.03	0.06	14.81	3.00	94	1.80%	11	1.71%
	(0.61)	(0.03)	(0.04)	(0.07)	(0.03)	(0.05)	(14.84)	(3.00)				
Dominican Republic	0.64	0.09	0.07	0.06	0.02	0.12	16.54	3.00	61	1.17%	9	1.40%
	(0.67)	(0.04)	(0.05)	(0.04)	(0.04)	(0.11)	(15.72)	(3.00)				
Ecuador	0.70	0.06	0.03	0.04	0.02	0.13	16.29	2.78	398	7.63%	43	6.67%
	(0.82)	(0.00)	(0.02)	(0.03)	(0.02)	(0.11)	(16.20)	(3.00)				
Egypt	0.34	0.38	0.05	0.02	0.05	0.38	17.31	2.65	31	0.59%	3	0.47%
	(0.34)	(0.32)	(0.05)	(0.01)	(0.06)	(0.38)	(17.44)	(3.00)				
El-Salvador	0.54	0.24	0.07	0.07	0.03	0.12	15.59	2.92	100	1.92%	10	1.55%

Table 7.1

Cross-country summary statistics of capital structure variables and other MFI-level variables

Country	LEV	SUBS	TANG	RISK	PROFIT	LIQUID	SIZE	AGE	Obs	% Obs	MFI	% MFI
	(0.62)	(0.17)	(0.05)	(0.07)	(0.03)	(0.10)	(15.51)	(3.00)				
Georgia	0.63	0.16	0.05	0.04	0.05	0.10	15.84	2.32	85	1.63%	11	1.71%
	(0.74)	(0.00)	(0.04)	(0.02)	(0.05)	(0.07)	(15.85)	(3.00)				
Ghana	0.58	0.46	0.06	0.08	0.07	0.16	13.29	2.21	19	0.36%	3	0.47%
	(0.73)	(0.22)	(0.05)	(0.04)	(0.04)	(0.16)	(13.18)	(3.00)				
Guatemala	0.47	0.14	0.03	0.06	0.04	0.13	15.44	2.80	148	2.84%	16	2.48%
	(0.52)	(0.02)	(0.02)	(0.05)	(0.04)	(0.07)	(15.49)	(3.00)				
Haiti	0.77	0.01	0.07	0.10	0.04	0.19	16.45	2.59	41	0.79%	4	0.62%
	(0.78)	(0.00)	(0.06)	(0.08)	(0.04)	(0.18)	(16.50)	(3.00)				
Honduras	0.55	0.11	0.07	0.08	0.02	0.12	15.60	2.78	158	3.03%	18	2.79%
	(0.67)	(0.02)	(0.04)	(0.06)	(0.04)	(0.09)	(15.59)	(3.00)				
India	0.75	0.02	0.03	0.04	0.02	0.16	15.95	2.33	629	12.06%	94	14.57%
	(0.82)	(0.00)	(0.01)	(0.01)	(0.01)	(0.13)	(15.98)	(3.00)				
Indonesia	0.76	0.08	0.04	0.13	0.02	0.21	14.90	2.47	92	1.76%	16	2.48%
	(0.83)	(0.00)	(0.04)	(0.03)	(0.06)	(0.19)	(14.75)	(3.00)				
Jordan	0.43	0.36	0.02	0.02	0.06	0.06	16.57	2.82	11	0.21%	1	0.16%
	(0.50)	(0.26)	(0.02)	(0.01)	(0.06)	(0.05)	(16.64)	(3.00)				
Kazakhstan	0.59	0.04	0.04	0.05	0.04	0.14	16.07	2.56	54	1.04%	6	0.93%
	(0.74)	(0.00)	(0.04)	(0.03)	(0.04)	(0.09)	(16.24)	(3.00)				
Kenya	0.80	0.09	0.05	0.09	0.00	0.23	17.77	2.77	66	1.27%	7	1.09%
	(0.81)	(0.00)	(0.04)	(0.08)	(0.00)	(0.22)	(17.68)	(3.00)				
Kosovo	0.59	0.20	0.02	0.04	0.00	0.10	15.79	2.53	55	1.05%	7	1.09%
	(0.65)	(0.03)	(0.02)	(0.03)	(0.01)	(0.10)	(15.85)	(3.00)				
Kyrgyzstan	0.66	0.03	0.04	0.03	0.06	0.12	15.71	2.23	87	1.67%	10	1.55%
	(0.66)	(0.00)	(0.03)	(0.02)	(0.05)	(0.09)	(15.70)	(2.00)				
Macedonia	0.69	0.00	0.03	0.11	0.01	0.11	16.43	2.85	20	0.38%	2	0.31%
	(0.68)	(0.00)	(0.03)	(0.11)	(0.01)	(0.10)	(16.54)	(3.00)				
Mexico	0.58	0.02	0.05	0.07	0.03	0.14	16.32	2.27	244	4.68%	32	4.96%
	(0.63)	(0.00)	(0.03)	(0.05)	(0.04)	(0.13)	(16.12)	(2.00)				
Mongolia	0.65	0.05	0.06	0.03	0.05	0.13	16.80	2.45	38	0.73%	5	0.78%
	(0.71)	(0.00)	(0.05)	(0.02)	(0.04)	(0.09)	(15.75)	(3.00)				
Morocco	0.75	0.20	0.03	0.03	0.01	0.13	16.14	2.91	32	0.61%	3	0.47%
	(0.78)	(0.14)	(0.03)	(0.02)	(0.02)	(0.10)	(15.89)	(3.00)				
Mozambique	0.45	0.03	0.17	0.04	-0.04	0.23	15.19	1.64	14	0.27%	2	0.31%
	(0.39)	(0.01)	(0.13)	(0.03)	(0.00)	(0.18)	(15.13)	(1.50)				
Nepal	0.87	0.01	0.02	0.04	0.04	0.20	14.83	2.73	198	3.80%	28	4.34%
	(0.90)	(0.00)	(0.01)	(0.01)	(0.03)	(0.16)	(15.06)	(3.00)				
Nicaragua	0.70	0.09	0.04	0.08	0.01	0.12	16.01	2.91	190	3.64%	20	3.10%
	(0.74)	(0.05)	(0.03)	(0.04)	(0.02)	(0.10)	(15.99)	(3.00)				
Nigeria	0.64	0.07	0.08	0.12	-0.05	0.27	15.38	1.90	60	1.15%	13	2.02%

Table 7.1

Cross-country summary statistics of capital structure variables and other MFI-level variables

Country	LEV	SUBS	TANG	RISK	PROFIT	LIQUID	SIZE	AGE	Obs	% Obs	MFI	% MFI
	(0.74)	(0.00)	(0.06)	(0.04)	(0.00)	(0.25)	(16.11)	(2.00)				
Pakistan	0.73	0.21	0.05	0.04	-0.04	0.26	16.19	2.44	149	2.86%	18	2.79%
	(0.76)	(0.08)	(0.03)	(0.02)	(0.00)	(0.21)	(15.97)	(3.00)				
Palestine	0.22	0.62	0.02	0.17	-0.02	0.21	15.98	2.97	31	0.59%	3	0.47%
	(0.21)	(0.57)	(0.02)	(0.11)	(0.01)	(0.23)	(16.14)	(3.00)				
Panama	0.52	0.19	0.04	0.05	0.03	0.12	15.33	2.68	37	0.71%	4	0.62%
	(0.61)	(0.03)	(0.03)	(0.05)	(0.02)	(0.07)	(15.79)	(3.00)				
Paraguay	0.77	0.01	0.04	0.06	0.04	0.18	17.74	3.00	59	1.13%	6	0.93%
	(0.85)	(0.00)	(0.03)	(0.05)	(0.03)	(0.19)	(17.93)	(3.00)				
Peru	0.70	0.09	0.03	0.05	0.04	0.12	17.60	2.86	152	2.91%	15	2.33%
	(0.81)	(0.00)	(0.03)	(0.05)	(0.04)	(0.12)	(18.20)	(3.00)				
Philippines	0.92	0.05	0.05	0.07	0.03	0.16	16.37	2.68	73	1.40%	8	1.24%
	(0.84)	(0.00)	(0.05)	(0.05)	(0.03)	(0.15)	(16.50)	(3.00)				
Romania	0.81	0.04	0.01	0.15	0.00	0.17	16.33	2.79	19	0.36%	2	0.31%
	(0.85)	(0.00)	(0.01)	(0.11)	(-0.01)	(0.15)	(16.44)	(3.00)				
Russia	0.75	0.05	0.02	0.04	0.02	0.14	15.53	2.42	69	1.32%	9	1.40%
	(0.84)	(0.00)	(0.01)	(0.02)	(0.01)	(0.09)	(15.63)	(3.00)				
Samoa	1.44	0.07	0.05	0.02	0.02	0.24	14.46	2.64	11	0.21%	1	0.16%
	(1.36)	(0.01)	(0.05)	(0.01)	(0.05)	(0.23)	(14.47)	(3.00)				
Senegal	0.62	0.05	0.08	0.07	0.10	0.11	16.46	2.70	40	0.77%	6	0.93%
	(0.78)	(0.04)	(0.08)	(0.07)	(0.01)	(0.10)	(17.31)	(3.00)				
Serbia	0.30	0.32	0.04	0.07	0.03	0.15	16.30	2.30	20	0.38%	2	0.31%
	(0.09)	(0.00)	(0.02)	(0.05)	(0.04)	(0.10)	(15.70)	(2.00)				
Sri Lanka	0.65	0.34	0.04	0.05	-0.01	0.11	14.49	2.08	66	1.27%	12	1.86%
	(0.66)	(0.22)	(0.03)	(0.03)	(0.00)	(0.07)	(14.42)	(2.00)				
Tajikistan	0.63	0.07	0.05	0.02	0.06	0.15	15.65	2.26	98	1.88%	11	1.71%
	(0.75)	(0.00)	(0.05)	(0.02)	(0.06)	(0.08)	(15.96)	(2.00)				
Togo	0.77	0.10	0.06	0.10	0.01	0.20	15.42	2.82	28	0.54%	3	0.47%
	(0.89)	(0.01)	(0.05)	(0.08)	(0.00)	(0.19)	(14.50)	(2.00)				
Tunisia	0.60	0.17	0.07	0.01	0.06	0.03	17.38	3.00	11	0.21%	1	0.16%
	(0.69)	(0.05)	(0.08)	(0.01)	(0.07)	(0.03)	(17.63)	(3.00)				
Uzbekistan	0.56	0.00	0.04	0.01	0.02	0.21	18.08	2.11	18	0.35%	3	0.47%
	(0.60)	(0.00)	(0.04)	(0.00)	(0.01)	(0.22)	(19.30)	(2.00)				
Total									5215	100%	645	100%

This tabel represents mean (median in parenthesis) values of capital structure variables (leverage and subsidies) and other Firm-specific variables from 56 countries.

Table 7.2

Description and summary statistics of institutional specific variables

Name (abbreviation)	Description	Statistics		
		Mean	Median	Obs
Creditors right index (CREDRIGHT)	Measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders. Source: Doing Business.	5.064	5.000	56
Credit information index (CREDINFO)	Measures rules and practices affecting the coverage, scope and accessibility of credit Information available through either a credit bureau or a credit registry. Source: Doing Business.	3.739	5.000	56
Financial sector development (FINDEV)	Domestic credit to private sector (% of GDP). Source: World bank database.	0.342	0.317	56
Legal Origin (LEGAL)	Measure by a dummy variable that takes the value 1 if the country adopts the common-law system and 0 otherwise. This variable comes from La Porta et al. (1997)	0.280	0.000	56
Corruption (CORRUP)	Reflects perceptions of the extent to which public power is exercised for private gain as captured by World Governance Indicators.	-0.623	-0.620	56
Political stability (POLSTA)	Index: Political stability and absence of violence/terrorism (-2.5 to 2.5; WGI).	-0.792	-0.740	56
Regulation (REGUL)	Binary variable: 1 for countries with prudential regulation for MFI, 0 otherwise. Source: Mix market database	0.657	1.000	56
Eonomic Growth (GDP)	Annual growth rate of the GDP per capita of a country. Source: World bank database.	0.038	0.036	56

This table reports institutional variable names, abbrevaiations, definations, sources of data, number of observations, and means/medians of the available data. Obs. Is the number of countries with available data and information.

7.2. Multivariate results

7.2.1. The impact of firm-specific factors

The discussion of the results starts by country-by-country analysis of Firm-specific determinants of financing choices. The regression to explain MFI financing choices from the Firm-specific factors as shown in Equation (5.4). The results for each dependent variable is reported in Tables 7.3 and 7.4 respectively.

7.2.1.1. Leverage model

The study finds that less than half of the coefficients of tangibility to be statistically significant and majority are at odds with theoretical prediction. The cross-sectional regressions yields as many as 19 significant negative coefficients for tangibility and while 14 more coefficient are in the same direction. This contradicts the bankruptcy cost argument that higher tangibility results in lower risk to creditors which results in firm high level of leverage (Gropp and Heider, 2010; Frank and Goyal, 2009; de Jong et al., 2008; Rajan and Zingales, 1995) and those obtained in microfinance sector (Tchhigoua, 2015). To explain this, collateral is seen as a signalling tool that helps to avoid adverse selection, that is, ex-ante asymmetric information. In this case, collateral is driven by the ex-ante private information from MFIs. Given the poor accounting standard and lack of independent third party rating, the problem of information asymmetry is inherent in the microfinance sector (Gosh and Tassel, 2013). Creditors tend to have less appetite to lend in such situations, even with high level of collateral.

Similar to tangibility results, the study find 11 significnant and 22 nonsignificant negative coefficients for MFI risk on leverage. The findings that more than half of the coefficient in the sample are in the same direction is in line with the findings of Lemmon et al. (2008) and Gropp and Heider (2010), where risk is found to significantly reduce leverage in the banking sector.

Unlike, Rajan and Zingales (1995) and Frank and Goyal (2009) which find that risk is not a reliable driver of firm capital structure. The argument that higher risk means higher volatility of earnings and higher probability of bankruptcy and less debt. The risk of default for a financial firm such as MFIs is important if the quality of credit portfolio is bad. However, outdtanding loans represents a significant portion of MFIs total assets. As a result highly contaminated portfolio increases the risk of default for MFIs. Therefore, MFIs with poor portfolio quality tend to avoid the risk of failure by strengthening their equity and thus reducing their leverage as observed by Tchuigoua (2015).

The study observe that the impact of profitability on leverage are consistent with the pecking order theory which suggest that firms use internal financing for new investment and when the need for external financing arises, firms choose debt over equity (Myers and Majluf, 1984). Consistent with prior studies (Rajan and Zingales, 1995; Booth et al., 2001; Fan et al.,2012; de Jong et al., 2008), the expected negative relationship between profitability and leverage is found in 23 countries in this sample. The empirical studies on microfinance (Tchuigoua, 2014; 2015; Mersland and Urgeghe, 2013) seems to confirm the hypothesis that negative relation exist between profitability and leverage. This relationship cane be explained using the pecking order theory framework. Due to asymmetric information problem synonymous with MFIs (Garmaise and Natividad, 2010), MFIs prefer internal source of funding, in this case retained earnings than external. As for the impact of liquidity, the findings show that there are more significant negative relationship between liquidity and leverage in the sample. This is in line with the conventional theories that high liquidity reduces exposure to the risk of being unable to meet short-term financial commitments and the appetite for raising debt.

The result shows 33 countries with significant positive between MFI size and leverage. The findings in morethan half of the countries in the sample are statistically significant and consistent with the theoretical prediction that larger firms are more leveraged than smaller firms (Rajan and Zingales, 1995; de Jong et al., 2008; Bogan, 2012; Tchuigoua, 2014). MFI size can as well serve as a subtitute or proxy for bankruptcy cost. Our results consistent with Berger et al. (2008) note that, large MFIs tend to be more diversified, to be more experienced in risk management, and low probability of bankruptcy (Hartarska and Nadolnyak, 2008). Finally, there are mixed significant results for MFI age and leverage, although empirical studies based on life cycle theory suggest a positve relationship between mature MFIs and leverage (Fehr and Hishigsuren, 2004; Bogan, 2012). The mixed result may be explained by the nature of our sample.

7.2.1.2. Subsidy model

The study also observes that the impact of tangibilty on MFIs choice of subsidies yields statistically significant coeffients in 14 countries. Eight out of the fourteen significant coefficients are positive, meaning to say that there is a positive relationship between tangibility and subsidies. This result is consistent with previous study by Tchuigoua (2015). It shows that donor agencies care about risk when they decide to fund MFIs. Consistent with prior studies (Tchuigoua, 2014) this chapter finds mixed results on the impact of risk on subsidies. Risk is not an important determinants of donor funding as evidenced by Tchuigoua, (2015). The amount of subsidies to MFIs increases when the MFIs' loan portfolio is healthy. This result suggests that donors pay attention to how MFIs efficiently use their grants and subsidies, and how efficiently they recover loans they allocate.

The study find mixed results between profitability and subsidies. This result is not consistent with the empirical evidence on the value relevance of accounting information in the decision to make donations, that supports the positive relation between financial stability and donations (Trussel and

Parsons 2007). The rating scores and the profitability of MFIs better inform donors about MFIs past performance and global risk profile but are not drivers of subsidies. Being a for-profit MFI does not improve subsidies, given that the relation between the for-profit status and donations is not significant. This result also does not support the research on the field of microfinance (Fernando 2004; Ledgerwood and White 2006). In another angle, donor agencies are insentitive to profitability which is by product of commercialisation. Subsidies coming from donor agencies mostly targets outreach. The role of subsidy in reaching the vast majority of poor people is important from a welfarist point of view. The argument is that MFIs can be profitable only when they are able to continue with with operation, reaching poor clients (Woller et al., 1999). Thus, the impact of profitability on subsidies is insignificant. On the impact of liquidity, the results suggest a positive relationship between liquidity and subsidies in morethan half of the countries in our sample.

As expected, the study find a significant negative relationship between MFI size and subsidies in morethan half of the countries in the sample. The best explanation is that larger MFIs attract less subsidies compared to smaller MFIs. This result implies that donor agencies may tend to fund smaller MFIs because they are predominantly not profitable and are mostly start-ups. This argument is reinforced by Tchugoua (2014), which find a significant negative relatonship between MFI size and subsidised funding such as donated equity. When it comes to impact of MFIs age on subsidies, this chapter finds a significant positive relationship in 13 countries of the sample. This results is against the notion that mature MFIs tend to depend less on subsidized funding compared to younger MFIs (Armendáriz de Aghion and Morduch, 2005). This can be expalained by the fact maturity appears to be a proxy for reputation, professionalism and efficiency. Therefore, donor

agencies reflects the ability of the organization to effectively accomplish its mission of reaching many poorer clients.

Overall, there is significant evidence to support the view that the standard firm-specific determinants remain applicable to MFIs capital structure. More specifically, it is evident that firm-specific factors are also relevant on MFIs choice of leverage and subsidies. This evidence answers a part of our third research question that examines the impact of firm-specific factors on MFIs capital structure. We find that impact for some factors such as risk, profitability, liquidity and size on leverage is strong and consistent with standard capital structure theories across large number of countries. However, determinants such as tangibility and age show unexpected signs. Considering the impact of firm-specific factors on subsidies, the study finds that the impact of tangibility and size on subsidies are consistent with our predictions. However, results from a few determinants remain mixed, and in some countries, some coefficients are significant with an unexpected sign.

In order to proceed to the second step of the analysis, it is important to conduct additional analysis on the impact of firm-specific determinants on MFIs capital structure decision. More specifically, it is important to know if the impact of firm-specific determinants on MFI capital structure decision are the same or different across countries. If the firm-specific coefficients does not differ significantly across countries, it is wise to apply a single model for all MFIs across countries as done by Tchuigoua, (2014) in the microfinance sector and non-MFI studies (Fan et al., 2012: Booth et al., 2001), Otherwise the common method of pooling firm-specific determinants from different countries into one single regression model may wrongly force different firm-specific coefficients to be significant.

Table 7.3

The impact of Firm-specific variables on leverage across countries

Country	Intercept	TANG	RISK	PROF	LIQUID	SIZE	AGE	Obs	Adj- R^2
Afghanistan	-0.09	6.61***	-0.16	-0.12	0.73**	0.03	0.01	45	0.36
	(-0.12)	(3.29)	(-0.27)	(-0.50)	(2.05)	(0.47)	(0.13)		
Albania	8.92**	-6.36	2.91**	-0.01	-0.07	-0.63**	0.56***	13	0.72
	(3.44)	(-1.51)	(2.86)	(-0.01)	(-0.18)	(-3.40)	(3.85)		
Argentina	-0.24	-0.65	-0.92	0.04	-0.08	0.07***	-0.04	51	0.44
	(-0.68)	(-1.34)	(-0.97)	(0.26)	(-0.33)	(3.42)	(-1.28)		
Armenia	-0.29	-1.50	0.59	-1.24***	-0.33	0.07***	-0.02	65	0.25
	(-0.88)	(-1.65)	(0.69)	(-4.04)	(-1.34)	(2.99)	(-0.51)		
Azerbaijan	-0.62***	-0.96*	-0.53	-0.74***	0.39*	0.07***	0.06*	129	0.51
	(-4.86)	(-1.86)	(-0.81)	(-3.36)	(1.77)	(6.98)	(1.88)		
Bangladesh	0.86***	0.02	-0.93***	-2.49***	0.14	0.00	0.00	106	0.47
	(10.43)	(0.09)	(-6.41)	(-8.11)	(1.52)	(0.55)	(0.00)		
Benin	0.15	-1.62***	2.58***	-0.01	-1.05**	0.05*	0.01	17	0.70
	(0.44)	(-5.07)	(3.55)	(-1.11)	(-3.01)	(2.06)	(0.63)		
Bolivia	0.40**	-2.03***	-0.85***	-3.08***	-0.02	0.05***	-0.09	173	0.54
	(1.97)	(-2.97)	(-4.13)	(-8.63)	(-0.14)	(5.83)	(-1.66)		
Bosnia and Herzegovina	-0.99***	0.97**	0.55	-0.48*	-0.93***	0.11***	-0.07	100	0.51
	(-4.45)	(2.42)	(1.51)	(-1.71)	(-3.74)	(8.21)	(-2.01)		
Brazil	0.23	-0.52	-0.34	-0.25	-0.73***	0.01	0.08	76	0.17
	(0.62)	(-0.25)	(-1.26)	(-1.14)	(-2.86)	(0.63)	(1.25)		
Bulgaria	-0.34	-2.43***	-1.99**	-0.63	0.34	0.09	-0.17**	28	0.62
	(-0.23)	(-3.41)	(-2.01)	(-0.81)	(0.94)	(0.93)	(-2.71)		
Cambodia	0.45	0.75	7.16	0.75	-0.86	0.07*	-0.29**	123	0.01
	(0.76)	(0.19)	(1.41)	(0.89)	(-1.18)	(1.78)	(-2.28)		
Chile	-0.37	13.17**	-3.20**	-0.10	-0.60	0.04	-	14	0.78
	(-0.17)	(3.09)	(-2.86)	(-0.24)	(-1.25)	(0.29)	-		
Congo	-1.31***	-1.20*	-1.19	0.35	-0.37	0.16***	-0.18*	18	0.91
	(-3.27)	(-2.07)	(-1.61)	(0.94)	(-1.33)	(6.79)	(-1.89)		
Colombia	0.32***	-1.07***	-1.18***	-1.67***	0.08	0.02***	0.04*	138	0.33
	(2.79)	(-4.58)	(-2.80)	(-5.86)	(0.38)	(4.33)	(1.79)		
Costa Rica	0.69***	-1.22***	-0.65***	-0.96*	-0.59**	0.01	-	82	0.35
	(3.87)	(-4.61)	(-2.66)	(-1.96)	(-2.18)	(0.69)	-		
Dominican Republic	-0.35	2.05**	-1.68*	-0.05	0.33	0.06***	-	42	0.35
	(-1.25)	(2.44)	(-1.88)	(-0.06)	(1.01)	(3.76)	-		
Ecuador	-0.07	1.39***	-0.11	-2.71***	-0.09	0.07***	-0.10***	339	0.59
	(-0.79)	(5.56)	(-0.39)	(-9.49)	(-1.28)	(15.18)	(-5.46)		
Egypt	0.37	-2.08	-1.07	-0.02	0.16	0.01	-0.04	27	0.13
	(0.43)	(-1.59)	(-1.37)	(-0.01)	(0.67)	(0.16)	(-0.97)		
El Salvador	-1.48***	-0.60***	-0.04	-1.11***	0.40	0.16***	-0.14**	89	0.77

Table 7.3

The impact of Firm-specific variables on leverage across countries

Country	Intercept	TANG	RISK	PROF	LIQUID	SIZE	AGE	Obs	Adj- R^2
	(-5.64)	(-2.71)	(-0.11)	(-2.64)	(1.60)	(12.46)	(-2.60)		
Georgia	-0.54**	-1.58**	0.08	-0.02	-0.04	0.08***	-0.03	72	0.27
	(-1.94)	(-2.35)	(0.29)	(-0.06)	(-0.13)	(3.98)	(-0.76)		
Ghana	-0.83	3.74	-0.40	0.45	-1.36	0.06	0.29	11	0.15
	(-0.26)	(0.78)	(-0.16)	(0.77)	(-0.77)	(0.20)	(0.90)		
Guatemala	-0.55*	0.02	0.40	-0.84**	-0.52***	0.07***	-0.01	135	0.24
	(-1.78)	(0.03)	(1.07)	(-2.37)	(-3.32)	(4.32)	(-0.34)		
Haiti	-1.15	0.03	0.28	-0.98***	0.20	0.15***	-0.19***	34	0.64
	(-1.45)	(0.05)	(0.88)	(-3.53)	(0.87)	(2.96)	(-3.65)		
Honduras	0.09	-0.66**	-0.99***	-0.79**	-1.04***	0.04***	0.02	128	0.28
	(0.36)	(-1.99)	(-3.05)	(-2.30)	(-5.05)	(2.60)	(0.42)		
India	0.31*	1.39***	-0.05	0.06**	1.58***	0.01	0.05**	470	0.70
	(1.91)	(3.53)	(-1.27)	(2.26)	(28.19)	(0.49)	(2.24)		
Indonesia	1.35***	-0.38	0.02	0.03	-0.60***	-0.03*	0.02	59	0.25
	(4.90)	(-0.41)	(0.22)	(0.92)	(-3.35)	(-1.88)	(0.87)		
Jordan	-3.26	-0.52	1.13	1.84	0.03	0.20	0.10	10	0.84
	(-1.20)	(-0.13)	(0.52)	(0.28)	(0.02)	(1.12)	(0.43)		
Kazakhstan	1.16***	1.24	-1.09	-0.09	0.76*	-0.02	-0.10	38	0.01
	(2.77)	(0.86)	(-1.39)	(-0.13)	(1.86)	(-0.71)	(-0.64)		
Kenya	0.89***	0.61*	-0.05	0.56***	-0.07	0.01	-0.09***	38	0.31
	(8.04)	(1.98)	(-0.27)	(2.77)	(-0.69)	(1.13)	(-3.26)		
Kosovo	-0.75	-1.79	-2.50***	-0.90*	1.09**	0.05	0.20***	48	0.44
	(-1.59)	(-0.66)	(-2.94)	(-1.73)	(2.57)	(1.65)	(3.07)		
Kyrgyzstan	0.03	0.67	0.00	-0.65***	0.44	0.04*	-0.01	61	0.21
	(0.12)	(0.57)	(-0.09)	(-3.46)	(1.46)	(1.77)	(-0.16)		
Macedonia	-0.41***	-1.82**	-0.42**	-1.35**	0.04	0.07***	0.00	17	0.94
	(-3.56)	(-3.14)	(-2.42)	(-2.54)	(0.29)	(7.49)	(-0.04)		
Mexico	0.16	0.11	-0.81***	-0.43***	-0.58***	0.03***	0.03	199	0.22
	(1.09)	(0.32)	(-4.59)	(-3.67)	(-4.15)	(3.32)	(1.40)		
Mongolia	-0.12	-1.89**	-0.13	-0.03	-0.18	0.04**	0.12**	27	0.74
	(-0.50)	(-2.66)	(-0.14)	(-0.09)	(-0.58)	(2.57)	(2.44)		
Morocco	1.30***	-2.37	-0.09	-0.08	0.31	-0.01	-0.10	28	0.14
	(4.75)	(-1.67)	(-0.10)	(-0.21)	(1.71)	(-0.89)	(-1.47)		
Mozambique	-2.39***	-0.31	-1.20	0.00	-0.49**	0.20***	0.04	14	0.90
	(-4.79)	(-1.80)	(-1.43)	(0.55)	(-3.06)	(5.14)	(0.83)		
Nepal	0.53***	-0.96**	0.51***	-0.18***	-0.11**	0.02**	0.03*	123	0.29
	(4.15)	(-2.59)	(4.82)	(-3.31)	(-2.08)	(2.56)	(1.85)		
Nicaragua	0.21	-0.35	-0.01	-0.86***	-0.25*	0.05***	-0.08*	175	0.25
	(1.04)	(-0.88)	(-0.07)	(-5.37)	(-1.81)	(5.25)	(-1.91)		
Nigeria	0.21	-0.29	0.65	0.04	0.12	0.00	0.14*	34	0.02

Table 7.3

The impact of Firm-specific variables on leverage across countries

Country	Intercept	TANG	RISK	PROF	LIQUID	SIZE	AGE	Obs	Adj- R^2
	(0.42)	(-0.33)	(1.70)	(0.50)	(0.38)	(0.15)	(1.78)		
Pakistan	-0.22	-3.40***	0.68	-1.84***	-0.29*	0.05***	0.10***	131	0.29
	(-0.67)	(-4.52)	(1.62)	(-6.67)	(-1.67)	(2.74)	(2.81)		
Palestine	3.18***	2.87	-0.41	-0.04	-0.63***	-0.18***	-	27	0.66
	(3.51)	(1.51)	(-1.44)	(-0.12)	(-2.92)	(-3.24)	-		
Panama	-0.79**	1.85**	-0.15	-0.32	-0.05	0.06**	0.12**	29	0.70
	(-2.23)	(2.11)	(-0.28)	(-0.62)	(-0.35)	(2.54)	(2.66)		
Paraguay	0.57***	-4.31***	-0.64**	-0.37*	-0.28*	0.03***	-	47	0.87
	(4.84)	(-8.33)	-2.35	(-1.78)	(-1.70)	(4.32)	-		
Peru	0.20*	-2.27***	1.24***	-1.01***	0.31	0.04***	-0.05	131	0.65
	(1.68)	(-6.16)	(3.26)	(-3.48)	(1.41)	(6.90)	(-1.61)		
Philippines	0.86	0.88	0.99*	0.00	0.47	0.07	-0.49***	60	0.47
	(1.27)	(0.44)	(1.98)	(0.37)	(1.33)	(1.49)	(-4.05)		
Romania	-0.44	-3.19***	-0.01	-0.55***	-0.01	0.06***	0.09***	15	0.96
	(-1.75)	(-4.05)	(-0.20)	(-6.19)	(-0.25)	(4.54)	(7.10)		
Russia	1.88***	-0.84	0.01	-0.73	-0.98***	-0.07**	0.05	47	0.56
	(4.83)	(-1.11)	(0.01)	(-1.37)	(-4.65)	(-2.13)	(0.70)		
Samoa	8.95***	1.75	1.85	-4.17**	1.61*	-0.61***	0.36*	11	0.99
	(9.19)	(1.25)	(0.88)	(-3.84)	(2.24)	(-10.94)	(2.27)		
Senegal	1.52**	2.05	-0.73	0.01	1.63	-0.05	-0.12	22	0.43
	(2.17)	(0.98)	(-0.43)	(0.64)	(1.28)	(-1.38)	(-0.98)		
Serbia	-3.85***	-2.05***	-0.04	0.01	0.13	0.26***	0.00	19	0.98
	(-14.21)	(-5.66)	(-0.23)	(0.03)	(0.82)	(14.43)	(-0.05)		
Sri Lanka	-0.19	1.09	0.40	0.00	0.21	0.06	-0.07*	42	0.14
	(-0.24)	(1.59)	(0.56)	(-0.90)	(0.56)	(1.23)	(-1.69)		
Tajikistan	-0.45**	-0.85*	0.33	-0.43	-0.10	0.08***	-0.01	80	0.58
	(-2.55)	(-1.72)	(0.50)	(-1.40)	(-0.77)	(6.59)	(-0.54)		
Togo	-0.15	1.55	-0.23	1.23	-0.88	0.07***	-0.02	18	0.65
	(-0.26)	(0.68)	(-0.32)	(1.47)	(-1.34)	(3.44)	(-0.11)		
Tunisia	-3.20	1.36	-0.77	0.43	1.07	0.21*	-	11	0.91
	(-1.77)	(0.88)	(-0.24)	(0.13)	(0.52)	(2.25)	-		
Uzbekistan	-0.66***	-0.28	0.13	-0.84**	0.11	0.05***	0.16***	11	0.99
	(-6.48)	(-0.29)	(0.12)	(-2.95)	(0.80)	(5.98)	(13.12)		

This table presents regression results of leverage and Firm-specific variables for 56 countries using MFI-level data of 2004-2014 estimated from Eq. (1): $LEV_{it}= \beta_0+ \beta_1 TANG_{it} + \beta_2 RISK_{it} + \beta_3 PROF_{it} + \beta_4 LIQUI_{it} + + \beta_5 SIZE_{it} + \beta_6 AGE_{it} + \varepsilon_{it}$ where i denotes individual MFI and t denotes time. All other variables are defined in Table 3.3. White heteroscedasticity is used. ***, **, * indicates that the coefficient estimates are significantly different from zero at 1%, 5%, 10% levels. P-value is reported in parentheses. Obs. is the number of MFI-year observation per country in the regressions. Adj- $R^2$is the value of Adjusted R^2 for the regression.

Table 7.4: The impact of Firm-specific variables on subsidies across countries

Country	Intercept	TANG	RISK	PROF	LIQUID	SIZE	AGE	Obs	Adj- R^2
Afghanistan	-0.67	-4.34	1.38	-1.12*	-1.80**	0.10	0.02	38	0.18
	(-0.37)	(-0.92)	(1.11)	(-1.79)	(-2.20)	(0.75)	(0.12)		
Albania	0.49	-5.46	-0.81	0.56	0.38	0.04	-0.37	11	0.63
	(0.11)	(-0.70)	(-0.43)	(0.26)	(0.52)	(0.13)	(-1.40)		
Argentina	0.31**	-0.23	0.04	0.07	-0.15*	-0.02**	0.02*	21	0.30
	(2.18)	(-0.39)	(0.19)	(1.46)	(-2.00)	(-2.21)	(1.96)		
Armenia	1.23***	-0.06	-1.45	1.73***	0.62	-0.09***	0.10*	40	0.31
	(2.99)	(-0.06)	(-1.47)	(3.14)	(1.48)	(-3.33)	(1.97)		
Azerbaijan	0.97***	1.09	-2.78**	-0.55	-0.92***	-0.02	-0.16***	106	0.24
	(4.77)	(1.22)	(-2.57)	(-1.33)	(-2.70)	(-1.15)	(-3.27)		
Bangladesh	0.38***	-0.09	0.69***	0.79***	0.18*	-0.02***	-	100	0.32
	(4.12)	(-0.31)	(4.29)	(3.13)	(1.67)	(-4.37)	-		
Benin	0.75*	1.68***	-2.12***	-0.01	0.22	-0.04	-0.07**	16	0.76
	(1.96)	(5.24)	(-2.85)	(-0.48)	(0.46)	(-1.20)	(-2.35)		
Bolivia	0.35*	-0.72	1.56***	1.35***	0.52***	-0.04***	0.10**	163	0.50
	(1.92)	(-1.06)	(7.74)	(3.53)	(3.31)	(-5.13)	(2.00)		
Bosnia and Herzegovina	1.14***	-0.58**	-0.10	-0.07	0.53***	-0.06***	-0.01	93	0.37
	(7.26)	(-2.04)	(-0.34)	(-0.36)	(2.62)	(-6.29)	(-0.54)		
Brazil	0.03	5.07**	-0.16	-0.24	-0.44	-0.02	0.11	66	0.12
	(0.08)	(2.40)	(-0.59)	(-0.87)	(-1.67)	(-0.88)	(1.23)		
Bulgaria	3.85***	0.47	1.69**	-1.12*	-0.27	-0.28***	0.11***	24	0.75
	(3.67)	(0.66)	(2.52)	(-1.94)	(-0.73)	(-3.84)	(2.71)		
Cambodia	0.24*	-0.55	6.42***	-1.16***	0.13	0.00	-0.04	82	0.68
	(1.73)	(-0.56)	(4.43)	(-5.59)	(0.60)	(-0.53)	(-1.37)		
Chile	12.37	-27.17	2.42	1.16	2.14	-0.71	-	11	0.39
	(1.95)	(-1.63)	(0.83)	(0.83)	(1.07)	(-1.96)	-		
Congo	5.44***	-0.65	-1.13	2.86**	2.73***	-0.42***	0.53	15	0.78
	(4.54)	(-0.33)	(-0.45)	(2.61)	(3.07)	(-6.26)	(1.83)		
Colombia	0.26**	0.28	1.17***	0.23	0.32*	-0.02***	0.01	112	0.29
	(2.47)	(1.36)	(3.46)	(0.95)	(1.98)	(-4.68)	(0.51)		
Costa Rica	0.19*	0.88***	0.15	0.70**	0.53***	-0.02**	-	84	0.39
	(1.71)	(5.17)	(0.93)	(2.28)	(3.02)	(-2.21)	-		
Dominican Republic	0.54*	-0.32	0.57	-0.45	0.09	-0.03	-	31	0.11
	(1.90)	(-0.41)	(0.69)	(-1.16)	(0.25)	(-1.56)	-		
Ecuador	0.59***	-1.10***	-0.45*	-0.08	0.07	-0.03***	0.02	276	0.29
	(7.87)	(-5.48)	(-1.86)	(-0.35)	(0.68)	(-9.43)	(1.39)		
Egypt	1.79**	-0.66	0.19	-2.53***	0.21	-0.06	-0.07*	27	0.84
	(2.48)	(-0.60)	(0.29)	(-2.70)	(1.01)	(-1.49)	(-1.83)		
El Salvador	2.12***	-1.11***	-0.45	-0.65	0.09	-0.14***	0.13	66	0.37
	(3.62)	(-2.77)	(-0.61)	(-0.83)	(0.21)	(-5.43)	(1.20)		

Table 7.4: The impact of Firm-specific variables on subsidies across countries

Country	Intercept	TANG	RISK	PROF	LIQUID	SIZE	AGE	Obs	Adj- R^2
Georgia	1.80***	-1.34	1.72	0.72*	0.39	-0.14***	0.21***	52	0.22
	(4.26)	(-0.97)	(1.59)	(1.74)	(0.91)	(-4.13)	(2.75)		
Ghana	3.07	-2.68	2.51	-0.09	0.05	-0.15	-0.25	9	0.30
	(0.21)	(-0.08)	(0.44)	(-0.05)	(0.01)	(-0.14)	(-0.33)		
Guatemala	1.49***	1.01	-1.40***	-0.64	-0.30	-0.10***	0.09*	115	0.19
	(4.24)	(0.96)	(-2.93)	(-1.53)	(-1.16)	(-4.77)	(1.71)		
Haiti	0.79***	-0.40***	-0.10	-0.08	-0.04	-0.05***	0.03***	26	0.54
	(5.36)	(-3.59)	(-1.71)	(-1.53)	(-0.92)	(-5.46)	(3.42)		
Honduras	0.73***	0.80***	0.04	-2.39***	0.74***	-0.04***	-0.04	121	0.58
	(3.84)	(3.24)	(0.16)	(-9.24)	(4.58)	(-2.92)	(-0.93)		
India	0.10**	-0.08	-0.01	-0.06***	0.04***	-0.01**	0.01*	288	0.04
	(2.32)	(-0.60)	(-0.74)	(-3.33)	(3.00)	(-2.39)	(1.93)		
Indonesia	0.35	0.51	-0.48	0.08	0.20	-0.02	0.01	23	0.21
	(0.60)	(0.28)	(-0.61)	(1.18)	(0.75)	(-0.63)	(0.22)		
Jordan	5.90*	-1.84	-0.99	-0.74	0.08	-0.30	-0.15	10	0.96
	(2.58)	(-0.53)	(-0.54)	(-0.13)	(0.06)	(-2.04)	(-0.72)		
Kazakhstan	0.36*	1.95***	-0.06	-0.24	0.20	-0.03**	0.03	25	0.20
	(1.87)	(2.85)	(-0.14)	(-0.74)	(1.10)	(-2.13)	(0.59)		
Kenya	-0.63	-2.33	0.01	3.59	-0.30	-0.01	0.37	15	0.24
	(-1.08)	(-1.54)	(0.02)	(1.54)	(-0.82)	(-0.47)	(1.80)		
Kosovo	1.22**	4.84***	0.92	1.22*	-1.12**	-0.06	-0.08	42	0.33
	(2.13)	(2.86)	(0.86)	(1.74)	(-2.03)	(-1.39)	(-1.09)		
Kyrgyzstan	0.47***	2.39***	-0.01	0.39***	0.21	-0.04***	0.04**	45	0.23
	(3.55)	(3.60)	(-0.48)	(2.75)	(1.51)	(-3.87)	(2.10)		
Macedonia	0.01	-0.01	0.06**	0.00	-0.05**	0.00	-0.01**	9	0.92
	(1.68)	(-0.23)	(6.91)	(-0.13)	(-4.87)	(0.75)	(-4.71)		
Mexico	0.22***	-0.18	-0.08	-0.06	-0.01	-0.01***	0.02*	137	0.04
	(2.96)	(-1.19)	(-0.86)	(-1.09)	(-0.09)	(-2.67)	(1.75)		
Mongolia	0.30	-1.09	1.70	-0.68	-0.42	-0.01	0.02	20	0.05
	(1.04)	(-1.21)	(0.64)	(-1.60)	(-1.00)	(-0.56)	(0.30)		
Morocco	0.99**	4.61*	3.00**	0.27	-0.62***	-0.05**	-0.07	27	0.64
	(2.36)	(1.76)	(2.53)	(0.54)	(-2.78)	(-2.10)	(-0.84)		
Mozambique	-1.33**	0.05	-1.05**	-0.03**	-0.04	0.09**	0.05*	9	0.92
	(-5.82)	(0.88)	(-5.34)	(-8.02)	(-0.76)	(5.54)	(3.64)		
Nepal	-0.01	0.17**	0.01	-0.01	0.01	0.00	0.00	77	0.08
	(-0.42)	(2.03)	(0.19)	(-0.35)	(0.39)	(0.07)	(1.01)		
Nicaragua	0.70***	-0.60	-0.02	-0.05	0.21*	-0.05***	0.05	163	0.20
	(3.91)	(-1.55)	(-0.24)	(-0.33)	(1.88)	(-5.64)	(1.41)		
Nigeria	0.76	1.28	-0.47	0.55	-0.04	-0.05**	0.03	19	0.33
	(1.60)	(1.64)	(-1.18)	(1.09)	(-0.14)	(-2.43)	(0.41)		
Pakistan	1.69***	-0.04	1.50***	-0.40	-0.13	-0.10***	0.04	106	0.39

Table 7.4: The impact of Firm-specific variables on subsidies across countries

Country	Intercept	TANG	RISK	PROF	LIQUID	SIZE	AGE	Obs	Adj- R^2
	(4.71)	(-0.05)	(3.20)	(-1.42)	(-0.65)	(-5.06)	(1.03)		
Palestine	1.55	-11.70	0.53	-0.15	-0.94	-0.04	-	22	0.29
	(0.35)	(-1.32)	(0.43)	(-0.11)	(-1.00)	(-0.14)	-		
Panama	2.76***	1.23	0.20	-0.33	0.64***	-0.22***	0.28***	30	0.91
	(6.32)	(1.13)	(0.30)	(-0.60)	(3.48)	(-7.15)	(5.34)		
Paraguay	0.57***	-1.56**	-0.35	-0.11	0.04	-0.03***	-	29	0.36
	(4.31)	(-2.61)	(-0.88)	(-0.49)	(0.19)	(-3.74)	-		
Peru	0.49***	0.63	-1.53**	-0.15	-0.05	-0.03***	0.04	88	0.36
	(3.51)	(1.58)	(-2.09)	(-0.43)	(-0.15)	(-3.37)	(1.00)		
Philippines	0.65**	0.57	-0.75***	0.00	-0.19	-0.01	-0.14**	55	0.29
	(2.17)	(0.69)	(-3.50)	(0.11)	(-1.31)	(-0.47)	(-2.79)		
Russia	-0.67	-0.08	1.24	1.48	0.32	0.04	0.02	35	0.19
	(-1.20)	(-0.06)	(1.03)	(1.30)	(0.91)	(0.72)	(0.18)		
Samoa	-0.01	-0.47	1.08	-0.43	-1.13	0.07	-0.23	8	0.78
	(0.00)	(-0.17)	(0.20)	(-0.22)	(-0.87)	(0.24)	(-0.58)		
Senegal	-0.11	-0.79**	-0.89***	0.00	0.30	-0.01	0.12***	20	0.67
	(-0.99)	(-2.62)	(-3.60)	(-1.30)	(1.62)	(-1.28)	(5.36)		
Serbia	0.83	-2.49	0.06	1.96	-1.25	0.00	-0.14	17	0.45
	(0.40)	(-1.15)	(0.05)	(0.60)	(-1.24)	(0.01)	(-0.96)		
Sri Lanka	2.43	-1.80	-0.74	-1.01	-0.08	-0.12	-0.14	29	0.22
	(1.25)	(-1.01)	(-0.31)	(-0.64)	(-0.09)	(-0.92)	(-1.35)		
Tajikistan	0.72***	0.04	0.08	1.05**	-0.05	-0.03**	-0.07**	63	0.34
	(2.82)	(0.06)	(0.09)	(2.56)	(-0.27)	(-2.03)	(-2.12)		
Togo	2.14***	-1.73	-0.34	1.38	0.91	-0.04*	-0.51***	16	0.61
	(3.72)	(-0.63)	(-0.46)	(1.53)	(1.27)	(-1.94)	(-2.52)		
Tunisia	4.23*	-0.85	-0.01	-2.18	0.55	-0.22*	-	11	0.88
	(2.16)	(-0.51)	(0.00)	(-0.61)	(0.25)	(-2.20)	-		

This table presents regression results of leverage and Firm-specific variables for 54 countries using MFI-level data of 2004-2014 estimated from Eq. (1): $SUBS_{it} = \beta_0 + \beta_1 TANG_{it} + \beta_2 RISK_{it} + \beta_3 PROF_{it} + \beta_4 LIQUI_{it} + + \beta_5 SIZE_{it} + \beta_6 AGE_{it} + \varepsilon_{it}$ where i denotes individual MFI and t denotes time. All other variables are defined in Table 3.3. White heteroscedasticity is used. ***, **, * indicates that the coefficient estimates are significantly different from zero at 1%, 5%, 10% levels. P-value is reported in parentheses. Obs. is the number of MFI-year observation per country in the regressions. Adj- $R^2$is the value of Adjusted R^2 for the regression.

To test whether each firm-specific coeffcients are equal across countries, this chapter employs the *f*-test setup described ealier in the methodology section. The *f*-test results are reported in Table 7.5. For the test involving the six firm-specific coefficients with leverage, we accept the null hypothesis

(all firm-specific coefficients are equall across countries) of all the firm-specific coeffcients except for *TANG* coefficient. This result provides a strong statistical evidence that all of the firm-specific coefficient are equal for 56 countries in our sample except tangibility. Similarly, we accept the null hypothesis (all firm-specific coefficients are equal across countries) that firm-specific coefficients are equal across countries except for *RISK* coefficients in the subsidy model. However, for the most important test on equality of coefficients for all the firm-specific factors. The calculated values are 7.76 and 6.69. This result provide a strong statistical evidence that all firm-specific coefficients are not equal across the 56 countries in our sample. This evidence provide answer to our important research question of whether the impact of firm-specific determinants is equal across countries.

The implication of this results means that it is not valid to construct a single model that pools all MFIs across countries as in (Tchuigoua, 2014) to test the impact of institutional-specific factors by simply assuming that the impact of firm-specific determinants on capital structure of MFIs are equal across countries. This results is in line with de Jong et al., (2008) findings on firms across 42 countries. Their findings, though similar to ours, suggest the use of country dummies as a potential solution to capture the influence of institutional-specific factors on firms capital structure. By doing that, it would allow each country to serve as an observation in the analysis, rather than pooling all MFIs in all countries.

7.2.2. Direct impact of institutional-specific factors

The results that examines the direct impact of institutional variables on MFIs capital structure are reported on Tables 7.6 and 7.7. The estimated regression coefficients of the explanatory variables are presented in different columns. It was observed that none of the regression model has an adjusted-R^2 below 10% when leverage is the dependent variable while we observe 7% adjusted-

R^2 when the dependent variable is subsidies. Overall, it indicates that the model specification used in this chapter captures a good part of the variation in country dummy coefficients. Therefore, institutional factors plays a vital role in explaining the capital structure of MFIs.

Table 7.5 f-test for the equality of coefficients of Firm-specific determinants across countries

Panel A						
Variables	TANG	RISK	PROF	LIQUI	SIZE	AGE
LEVERAGE						
f-statistics	12.44	1.57	3.48	1.32	0.62	0.48
p-value	0.002	0.220	0.073	0.261	0.436	0.492
Results	Rejection	No-rejection	No-rejection	No-rejection	No-rejection	No-rejection
Panel B						
SUBSIDIES						
f-statistics	4.23	15.35	3.95	1.51	2.43	0.01
p-value	0.052	0.001	0.060	0.233	0.134	0.923
Results	No-rejection	Rejection	No-rejection	No-rejection	No-rejection	No-rejection
Panel C						
Variables	LEVERAGE			SUBSIDIES		
f-statistics	7.756			6.692		
p-value	0.000			0.000		
N	4101			3159		
K	36			36		
J	330			318		
Results	Rejection			Rejection		

This table presents the test results whether each Firm-specific coefficients is the same across countries in panel A and Panel B. Panel C presents results on the equality of coefficients across all the 56 countries. Rejection means the coefficients are not equal across countries. Rejection is at 5% level.

7.2.2.1. Leverage model

The result show that the leverage undertaking of MFIs is directly determined by a number of institutional-specific variables such as credit information bureau, country's legal origin, political stability and prudential regulations. The study finds a consistent statistically significant relationship between credit information bureau and MFIs leverage. Higher level of information sharing is negatively related to leverage, contradicting findings by Sorge and Zang (2010) that

higher levels of information sharing in the credit market reduces firms level of information asymmetry which results to higher share of leverage in firms capital structure. Perhaps microfinance institutions are synanymous to asymmetric information problems (Garmaise and Natividad, 2010). The culture of poor accounting standards and lack of independent third party rating agencies makes it difficult to identify clear predictors of success in the microfinance industry. Therefore, it can be argued that higher credit information reflects the non-fully commercial nature of MFIs and the riskiness of microfinance business hence, the negative impact on leverage. The result shows that credit information bureau leads to adverse selection in the credit market towards MFIs.

On the contrary, country's legal origin has a positive impact on leverage. MFIs in countries that adopt the common-law system tend to be more leveraged, confirming the findings from the literature (La Porta et al., 1998; Demirgüc-Kunt and Levine,2001; Tchuigoua, 2014). This is becaause common-law countries have good accounting standards and stronger investor protection. Similarly, Demirgüc-Kunt and Levine (2001), argue that common-law system creates incentives for market-based system that can easily create wealth. On the contrary, civil-law system tends to have underdeveloped financial systems. Due to these characterisitcs inherent in common-law countries, information asymmetry problem is greatly reduced and can therefore, facilitate more leverage undetaking by MFIs in these countries. Other control variables show interesting outcomes. Political stability is found to have positive impact on MFIs leverage. This is reasonable because political stability contributes to the certainty of returns for external investrors, which implies that MFIs operating in a more stable country are likely to me more leveraged. The study also finds that prudential regulation has strong positve impact on MFIs leverage. Countries with regulatory framework in place may tend to protect creditors and encourage transperency. As MFIs

become, regulated, commercial funding sources are far more willing to lend to them, hence the positive impact on leverage as in previous studies (Tchuigoua, 2014).

Table 7.6: Direct impact of institutional variables on MFIs leverage

Dependent variable	Explanatory variables									Adj-R^2	Obs
	Intercept	CREDRIGHT	CREDINFO	LEGAL	FINDEV	CORRUP	POLSTA	REGUL	GDP		
COUNTRYDUM LEV	0.406***	-0.004	-0.025***	0.135**	0.083	-0.044	0.050*	0.117***	-0.457	0.16	468
	(4.58)	(-0.42)	(-2.96)	(2.53)	(0.75)	(-0.99)	(1.76)	(3.07)	(-1.16)		
	0.381***	-0.003	-0.024***	0.135**	0.092	-0.047	0.049*	0.117***		0.16	468
	(4.43)	(-0.37)	(-2.81)	(2.55)	(0.83)	(-1.06)	(1.73)	(3.07)			
	0.491***	-0.003	-0.025***	0.131**	0.082	-0.066	0.058**		-0.457	0.15	477
	(5.84)	(-0.37)	(-2.89)	(2.45)	(0.74)	(-1.54)	(2.06)		(-1.17)		
	0.404***	-0.007	-0.025***	0.139***	0.118	-0.011		0.123***	-0.443	0.16	468
	(4.55)	(-0.78)	(-2.87)	(2.61)	(1.08)	(-0.26)		(3.24)	(-1.12)		
	0.380***	-0.006	-0.023***	0.139***	0.125	-0.014		0.123***		0.16	468
	(4.41)	(-0.73)	(-2.73)	(2.62)	(1.15)	(-0.35)		(3.24)			
	0.466***	-0.003	-0.023***	0.132**	0.089	-0.069	0.057**			0.15	477
	(5.72)	(-0.31)	(-2.74)	(2.46)	(0.81)	(-1.61)	(2.04)				
	0.494***	-0.007	-0.024***	0.135**	0.121	-0.029			-0.441	0.14	477
	(5.86)	(-0.79)	(-2.78)	(2.53)	(1.11)	(-0.74)			(-1.13)		
	0.470***	-0.006	-0.022***	0.136**	0.128	-0.032				0.14	477
	(5.76)	(-0.73)	(-2.64)	(2.53)	(1.17)	(-0.82)					

This table presents the WLS regression results of country dummy coeffcients (α_{jt}) against institutional-specific factors estimated in Equation (5.7): $\alpha_j = \gamma_0 + \gamma_1 CRERIGHT_{jt} + \gamma_2 CREINFO_{jt} + \gamma_3 LEGAL_{jt} + \gamma_4 FINDEV_{jt} + \gamma_5 CORRUP_{jt} + \gamma_1 POLSTA_{jt} + \gamma_1 REGUL_{jt} + \gamma_1 GDP_{jt} + w_{jt}$ in which the country dummy coefficients are estimated from Equation (5.6). All institutional variables are defined in Table 7.2. The weight are the inverse standard errors of the corresponding country dummy coefficients estimated from Equation (5.6). Regional dummies are included in the estimates (Not reported). The superscript *, ** and *** indicates statistical significance at 1%, 5% and 10% level respectively. Obs is the number of countries that have all instituional variables. Adj-R^2 is the value of adjusted-R^2 for the regression.

Table 7.7: Direct impact of institutional variables on MFIs subsidies

Dependent variable	Explanatory variables									Adj-R^2	Obs
	Intercept	CREDRIGHT	CREDINFO	LEGAL	FINDEV	CORRUP	POLSTA	REGUL	GDP		
COUNTRYDUM SUBS	-0.027	0.000	0.010	0.071	-0.258***	0.064*	-0.025	-0.075**	1.883***	0.14	437
	(-0.35)	(-0.05)	(1.30)	(1.40)	(-2.71)	(1.67)	(-1.02)	(-2.26)	(5.50)		
	0.1010	-0.001	0.003	0.057	-0.310***	0.088**	-0.021	-0.076**		0.08	437
	(1.31)	(-0.17)	(0.36)	(1.10)	(-3.16)	(2.25)	(-0.82)	(-2.21)			
	-0.079	-0.001	0.009	0.073	-0.256***	0.078**	-0.029		1.882***	0.13	446
	(-1.06)	(-0.10)	(1.28)	(1.45)	(-2.70)	(2.10)	(-1.17)		(5.60)		
	-0.023	0.001	0.009	0.070	-0.276***	0.047		-0.078**	1.873***	0.14	437
	(-0.29)	(0.15)	(1.25)	(1.38)	(-2.96)	(1.37)		(-2.34)	(5.47)		
	0.1040	0.000	0.002	0.057	-0.325***	0.074**		-0.078**		0.08	437
	(1.35)	(-0.01)	(0.32)	(1.09)	(-3.38)	(2.10)		(-2.28)			
	0.047	-0.002	0.003	0.060	-0.306***	0.101***	-0.025			0.07	446
	(0.64)	(-0.23)	(0.35)	(1.16)	(-3.13)	(2.64)	(-0.96)				
	-0.076	0.001	0.009	0.072	-0.277***	0.060*			1.870***	0.13	446
	(-1.02)	(0.13)	(1.21)	(1.43)	(-2.98)	(1.77)			(5.56)		
	0.049	0.000	0.002	0.060	-0.323***	0.085**				0.07	446
	(0.67)	(-0.04)	(0.30)	(1.15)	(-3.37)	(2.47)					

This table presents the WLS regression results of country dummy coeffcients (α_{jt}) against institutional factors estimated in Equation (5.7): $\alpha_j = \gamma_0 + \gamma_1 CRERIGHT_{jt} + \gamma_2 CREINFO_{jt} + \gamma_3 LEGAL_{jt} + \gamma_4 FINDEV_{jt} + \gamma_5 CORRUP_{jt} + \gamma_1 POLSTA_{jt} + \gamma_1 REGUL_{jt} + \gamma_1 GDP_{jt} + w_{jt}$ in which the country dummy coefficients are estimated from Equation (5.6). All institutional variables are defined in Table 7.2. The weight are the inverse standard errors of the corresponding country dummy coefficients estimated from Equation (5.6). Regional dummies are included in the estimates (Not reported). The superscript *, ** and *** indicates statistical significance at 1%, 5% and 10% level respectively. Obs is the number of countries that have all instituional variables. Adj-R^2 is the value of adjusted-R^2 for the regression.

7.2.2.2. Subsidy model

The regression results also show that Subsidies is directly related to a number of institutional-specific factors. The study finds that financial sector development is negatively related to subsidies. The possible explanation for this effect is that a developed financial sector enables MFIs to access other sources of financing (Vanroose and D'Espallier, 2013), which invariably reduces their dependence on subsidised funding. The availability and easy access to other classes of funding based on favourable terms makes MFIs less dependent on subsidies.

It was also found that the level of corruption has a positive impact on subsidies, which is contrary to the findings of prior studies Tchuigoua, (2014). The possible explanation for this is that, when a country has high level of corruption, MFIs may have less choice for raising finance in the credit market because of high level of information asymmetry due to corruption. Therefore, MFIs may tend to avoid legal contracts or may be pushed out of the formal credit market, hence the choice of non-legally binding form of financing such as subsidies.

Significant results were observed in some control variables. Regulatory framework have significant negative relationship with subsidies. This is expected because regulation tends to control MFIs activities and any source of funding that is not legally binding may not be encouraged by the regulatory bodies, hense the negative relationship. Results also show a significant positive relationship between economic growth and subsidies. The present results are also broadly consistent with previous MFIs studies, only that, there are recorded differences in coefficients. This diferences may be due to variation in econometric analysis, or simply due to sampling error. Other variables not examined in previous MFI studies are consistent outcomes with other corporate finance studies. Overall, our results show significant direct impact of institutional-specific factors on MFI capital structure (Leverage and Subsidy).

7.2.3. Indirect impact of institutional factors

One of the interesting arguments of this chapter is that institutional-specific factors may have potential influence on firm-specific determinants of capital structure. This chapter examines the role of institutional diffrences across countries and how they affect the impact of firm-specific factors. As previously discussed, the estimated coefficients of firm-specific variables for each country is used as dependent variables in all the capital structure models. The regression results of the indirect impact are presented in Tables 7.8 and 7.9 for leverage and Subsidies respectively. The estimated regression coefficients of institutional factors used as explanatory variables are presented in different columns.

The overall results indicates that institutional-specific factors have an influence on the roles of firm-specific determinants of capital structure. The study find a significant negative relationship between variable representing legal structure (*CREDRIGHT)* and the estimated coefficients of MFI size. This indicates that MFI size is relatively less important for MFIs choice of leverage. As MFI-size is reverse proxy of bankruptcy cost, strong creditor right protection may force MFIs to abide by their debt contracts thereby mitigating the role of MFI size. This is consistent with Gungoraydinoglu and Oztekin (2011) findings that quality enforcement of creditors right act as substitute mechanism to firm size for controlling financial distress. However, in countries with weak creditors right protection, the role of MFI size in reducing information asymmetry is further strenghtened. Although, we do not find any evidence for the relationship between legal structure variables and subsidies via the estimated coefiicients of asset tangibility, risk and MFI size.

The study also observe that credit market information *(CREDINFO)* indirectly influences MFIs leverage. We observe a significant negative impact on profitability coefficients. Countries with credit information registry have less asymmetric information problem between investors and

borrowers. As a result, the role of profitability as a source of internal finance is mitigated. The study argues that the presence of good credit information registry encourages MFIs to borrow more despite the availability of internal finance. We do not find evidence on subsidies as the coefficients of *(CREDINFO)* is not significant for both profitability and liquidity variables.

The study did not find any evidence on the impact of financial sector development on leverage via bankruptcy cost variables. However, this chapter finds a strong significant negative relationship between financial sector development *(FINDEV)* and the estimated coefficient of MFI-size. This means that in a developed financial sector, MFI-size is less important in determing MFI access to subsidies. Furthermore, the study observe several significant relationships that have interesting implications. Credit Information *(CREDINFO)* has a significant negative effect on MFI risk coefficent. When there is better credit information sharing in a country, MFIs are more likely to be more leveraged, thereby mitigating the influence of MFIs risk.

Countries legal origin *(LEGAL)* indirectly influences capital structure of MFIs. The negative impact on liquidity coefficients indicates that liquidity is relatively less important for leverage choice of MFIs. As liquidity is a proxy of pecking order assumption, better legal origin is likely to influence MFIs choice of external finance over internal finance. The control variable, corruption *(CORRUP)* shows up with a significantly mitigating impact on the role of risk in determining MFIs leverage, while regulation *(REG)* show a strengthening impact on the role of profitability. We do also observe several significant relationships on subsidies. The study finds significant negative effect between legal origin with liquidity. The control variables such as corruption level *(CORRUP)* and political stability *(POLSTA)* show up with a significantly mitigating impact on bankruptcy cost (MFI-size) variable and pecking order varibales (profitability and liquidity) respectively.

Overall, the results reported in Tables 7.6, 7.7, 7.8 and 7.9 suggest the critical role of institutional specific factors in determining the capital structure of microfinance institutions directly and indirectly. The study finds that variables characterising the legal structure (creditors right and legal origin) of countries and credit market informations to have significant direct and indirect impact on MFIs capital structure (Leverage and Subsidy).

Table 7.8: Indirect impact of institutional variables on MFIs leverage

Dependent variable	Explanatory variables									Adj-R^2	Obs
	Intercept	CREDRIGHT	CREDINFO	LEGAL	FINDEV	CORRUP	POLSTA	REGUL	GDP		
TANG	3.280*	-0.220	-0.190	0.545	-4.009*	0.334	0.553	0.063	17.718	0.28	53
	(1.77)	(-1.27)	(-1.14)	(0.56)	(-1.78)	(0.33)	(0.93)	(0.06)	(1.10)		
	2.834	-0.240	-0.215	0.547	-3.412	0.815		0.296	19.357	0.28	53
	(1.59)	(-1.39)	(-1.32)	(0.57)	(-1.58)	(0.93)		(0.30)	(1.21)		
	3.327**	-0.218	-0.188	0.554	-4.037*	0.307	0.562		17.797	0.30	53
	(2.00)	(-1.30)	(-1.17)	(0.59)	(-1.85)	(0.34)	(0.98)		(1.12)		
	3.454*	-0.196	-0.212	0.659	-3.691	0.174	0.625	0.153		0.28	53
	(1.87)	(-1.13)	(-1.28)	(0.68)	(-1.65)	(0.17)	(1.05)	(0.15)			
RISK	1.339	0.179	-0.228**	-0.045	0.166	-1.759***	0.625*	-1.020*	0.309	0.30	54
	(1.21)	(1.64)	(-2.02)	(-0.07)	(0.13)	(-2.99)	(1.94)	(-1.76)	(0.03)		
	1.556	0.156	-0.199*	-0.035	0.293	-1.213**		-0.869	2.022	0.25	54
	(1.36)	(1.39)	(-1.71)	(-0.05)	(0.22)	(-2.27)		(-1.46)	(0.20)		
	0.724	0.133	-0.256**	-0.219	0.266	-1.379**	0.549*		0.973	0.26	54
	(0.67)	(1.23)	(-2.22)	(-0.34)	(0.20)	(-2.46)	(1.68)		(0.10)		
	1.344	0.179*	-0.228**	-0.041	0.163	-1.760***	0.626*	-1.021*		0.31	54
	(1.23)	(1.66)	(-2.04)	(-0.07)	(0.13)	(-3.03)	(1.98)	(-1.78)			
PROF	0.668	0.107**	-0.240***	-0.465	0.715	-0.342	0.268	-0.822***	7.019	0.82	54
	(0.35)	(2.20)	(-4.60)	(-1.19)	(1.11)	(-1.26)	(1.33)	(-2.99)	(1.20)		

Table 7.8: Indirect impact of institutional variables on MFIs leverage

Dependent variable	Explanatory variables									Adj-R^2	Obs
	Intercept	CREDRIGHT	CREDINFO	LEGAL	FINDEV	CORRUP	POLSTA	REGUL	GDP		
	0.241	0.110**	-0.236***	-0.522	0.915	-0.198		-0.761***	9.273	0.81	54
	(0.13)	(2.25)	(-4.48)	(-1.33)	(1.45)	(-0.78)		(-2.78)	(1.64)		
	0.363	0.066	-0.317***	-0.733*	1.165*	0.017	0.168		5.389	0.78	54
	(0.18)	(1.31)	(-6.38)	(-1.77)	(1.70)	(0.06)	(0.78)		(0.85)		
	0.991	0.106**	-0.256***	-0.407	0.797	-0.400	0.337	-0.791***		0.81	54
	(0.53)	(2.17)	(-5.02)	(-1.04)	(1.24)	(-1.48)	(1.74)	(-2.87)			
LIQUID	1.048	0.002	-0.071	-0.903**	-0.430	0.570	0.086	1.028**	-12.281*	0.27	55
	(1.35)	(0.02)	(-0.99)	(-2.10)	(-0.45)	(1.55)	(0.39)	(2.48)	(-1.84)		
	1.023	-0.003	-0.073	-0.894**	-0.367	0.635*		1.065***	-12.125*	0.29	55
	(1.34)	(-0.03)	(-1.03)	(-2.10)	(-0.39)	(1.95)		(2.67)	(-1.84)		
	1.809**	0.050	-0.021	-0.816*	-0.852	0.190	0.208		-13.228*	0.18	55
	(2.39)	(0.64)	(-0.28)	(-1.80)	(-0.85)	(0.53)	(0.92)		(-1.87)		
	0.895	-0.009	-0.069	-1.065**	-0.433	0.650*	0.062	1.072**		0.23	55
	(1.13)	(-0.11)	(-0.94)	(-2.46)	(-0.44)	(1.73)	(0.27)	(2.52)			
SIZE	-0.338	-0.039**	0.006	-0.063	0.380	0.046	-0.104	0.108	2.181	0.31	55
	(-1.58)	(-2.05)	(0.29)	(-0.56)	(1.51)	(0.42)	(-1.63)	(0.86)	(1.08)		
	-0.268	-0.040**	0.009	-0.058	0.334	-0.038		0.058	1.868	0.28	55
	(-1.25)	(-2.04)	(0.43)	(-0.50)	(1.31)	(-0.39)		(0.47)	(0.92)		

Table 7.8: Indirect impact of institutional variables on MFIs leverage

Dependent variable	Explanatory variables									Adj-R^2	Obs
	Intercept	CREDRIGHT	CREDINFO	LEGAL	FINDEV	CORRUP	POLSTA	REGUL	GDP		
	-0.259	-0.036*	0.012	-0.044	0.356	0.000	-0.091		2.107	0.31	55
	(-1.34)	(-1.94)	(0.60)	(-0.40)	(1.43)	(0.00)	(-1.47)		(1.05)		
	-0.298	-0.037*	0.008	-0.056	0.393	0.038	-0.097	0.102		0.31	55
	(-1.41)	(-1.95)	(0.37)	(-0.50)	(1.56)	(0.34)	(-1.53)	(0.81)			

This table represents the WLS regression results of coefficients of Firm-specific variables in Table 7.3 estimated from Equation (5.4) against institutional-specific factors estimated in Equation (5.8): $\beta_{kj}= \lambda_0+ \lambda_1 CRERIGHT_j +\lambda_2 CREINFO_j+ \lambda_3 CONENFOR_j+ \lambda_4 CORRUP_j+\lambda_1 REG_j + \lambda_1 LEGORI_j + \lambda_1 FINDEV_j + \lambda_1 GDP_j+ e_k$ in which k denotes the coefficients of Firm-specific factors and j denotes a country. All instituional-specific variables are defined in Table 7.2. The weight are the inverse standard errors of the corresponding Firm-specific coefficients estimated in Equation (5.4). Regional dummies are included in the estimates (Not reported). The superscript *,** and *** indicates statistical significance at the 1%, 5% and 10% level, respectively. Obs means the number of countries that have all institutional variables. Adj-R^2 is the value of Adjusted-R^2 for the regression.

Table 7.9**:** Indirect impact of institutional variables on MFIs Subsidies

Dependent variable	Explanatory variables									Adj-R^2	Obs
	Intercept	CREDRIGHT	CREDINFO	LEGAL	FINDEV	CORRUP	POLSTA	REGUL	GDP		
TANG	0.519	0.198	0.364**	-1.094	-0.503	-0.984	-0.066	-1.281	-15.418	0.20	52
	(0.26)	(0.98)	(2.04)	(-0.86)	(-0.20)	(-0.90)	(-0.10)	(-1.17)	(-0.87)		
	0.564	0.202	0.366**	-1.107	-0.557	-1.038		-1.309	-15.538	0.22	52
	(0.29)	(1.02)	(2.10)	(-0.88)	(-0.23)	(-1.09)		(-1.25)	(-0.89)		
	-0.423	0.150	0.325*	-1.261	0.030	-0.437	-0.250		-17.133	0.20	52
	(-0.23)	(0.75)	(1.85)	(-0.99)	(0.01)	(-0.44)	(-0.40)		(-0.97)		
	0.290	0.196	0.376**	-1.347	-0.573	-0.823	-0.103	-1.360		0.21	52
	(0.15)	(0.97)	(2.12)	(-1.09)	(-0.22)	(-0.76)	(-0.16)	(-1.25)			
RISK	-0.686	0.047	0.125	0.761	0.269	0.964	-0.205	0.530	-3.810	0.02	54
	(-0.50)	(0.34)	(0.88)	(0.95)	(0.16)	(1.32)	(-0.51)	(0.73)	(-0.31)		
	-0.757	0.054	0.115	0.758	0.227	0.785		0.480	-4.371	0.04	54
	(-0.56)	(0.41)	(0.83)	(0.96)	(0.14)	(1.23)		(0.68)	(-0.36)		
	-0.367	0.070	0.139	0.851	0.217	0.766	-0.165		-4.155	0.03	54
	(-0.28)	(0.54)	(1.00)	(1.09)	(0.13)	(1.13)	(-0.42)		(-0.34)		
	-0.741	0.048	0.122	0.723	0.305	0.973	-0.216	0.538		0.04	54
	(-0.55)	(0.36)	(0.88)	(0.93)	(0.19)	(1.34)	(-0.55)	(0.75)			
PROF	0.884	-0.126	-0.049	-0.012	0.315	0.588	-0.844**	-0.609	-0.921	0.57	54
	(0.29)	(-1.61)	(-0.58)	(-0.02)	(0.30)	(1.33)	(-2.59)	(-1.36)	(-0.10)		
	2.231	-0.136	-0.062	0.170	-0.315	0.132		-0.802*	-8.028	0.51	54

Table 7.9**:** Indirect impact of institutional variables on MFIs Subsidies

Dependent variable	Explanatory variables									Adj-R^2	Obs
	Intercept	CREDRIGHT	CREDINFO	LEGAL	FINDEV	CORRUP	POLSTA	REGUL	GDP		
	(0.69)	(-1.63)	(-0.69)	(0.25)	(-0.29)	(0.31)		(-1.71)	(-0.83)		
	0.659	-0.156**	-0.106	-0.211	0.649	0.854**	-0.918***		-2.129	0.56	54
	(0.21)	(-2.05)	(-1.42)	(-0.34)	(0.63)	(2.13)	(-2.83)		(-0.22)		
	0.842	-0.126	-0.047	-0.020	0.305	0.595	-0.853***	-0.613		0.58	54
	(0.28)	(-1.63)	(-0.58)	(-0.03)	(0.30)	(1.39)	(-2.77)	(-1.40)			
LIQUID	-1.079*	-0.021	-0.020	-0.685**	1.399**	0.421	-0.364**	0.470	2.950	0.34	55
	(-1.99)	(-0.40)	(-0.40)	(-2.28)	(2.08)	(1.64)	(-2.38)	(1.63)	(0.63)		
	-0.972*	-0.004	-0.011	-0.722**	1.134	0.146		0.316	2.288	0.27	55
	(-1.71)	(-0.07)	(-0.22)	(-2.29)	(1.62)	(0.60)		(1.06)	(0.47)		
	-0.731	0.001	0.003	-0.645**	1.206*	0.247	-0.308**		2.518	0.32	55
	(-1.44)	(0.01)	(0.05)	(-2.12)	(1.79)	(1.04)	(-2.03)		(0.53)		
	-1.042*	-0.019	-0.021	-0.646**	1.400**	0.402	-0.358**	0.460		0.35	55
	(-1.95)	(-0.36)	(-0.42)	(-2.22)	(2.10)	(1.59)	(-2.36)	(1.60)			
SIZE	0.106	0.003	0.001	0.033	-0.374***	-0.219***	0.120***	-0.017	-0.133	0.73	55
	(1.00)	(0.34)	(0.13)	(0.60)	(-3.01)	(-4.04)	(3.81)	(-0.27)	(-0.13)		
	0.025	0.004	-0.002	0.027	-0.321**	-0.121**		0.041	0.229	0.64	55
	(0.21)	(0.35)	(-0.18)	(0.42)	(-2.26)	(-2.21)		(0.59)	(0.20)		
	0.094	0.003	0.000	0.030	-0.370***	-0.211***	0.118***		-0.122	0.74	55
	(0.99)	(0.31)	(0.05)	(0.56)	(-3.03)	(-4.55)	(3.90)		(-0.12)		

Table 7.9**:** Indirect impact of institutional variables on MFIs Subsidies

Dependent variable	Explanatory variables									Adj-R^2	Obs
	Intercept	CREDRIGHT	CREDINFO	LEGAL	FINDEV	CORRUP	POLSTA	REGUL	GDP		
	0.103	0.003	0.001	0.033	-0.374***	-0.218***	0.120***	-0.016		0.74	55
	(1.00)	(0.33)	(0.12)	(0.60)	(-3.05)	(-4.09)	(3.86)	(-0.27)			

This table represents the WLS regression results of coefficients of Firm-specific variables in Table 7.4 estimated from Equation (5.4) against institutional-specific factors estimated in Equation (5.8): $\beta_{kj}= \lambda_0+ \lambda_1 CRERIGHT_j +\lambda_2 CREINFO_j+ \lambda_3 CONENFOR_j+ \lambda_4 CORRUP_j+\lambda_1 REG_j + \lambda_1 LEGORI_j + \lambda_1 FINDEV_j + \lambda_1 GDP_j+ e_k$ in which k denotes the coefficients of Firm-specific factors and j denotes a country. All instituional-specific variables are defined in Table 7.2. The weight are the inverse standard errors of the corresponding Firm-specific coefficients estimated in Equation (5.4). Regional dummies are included in the estimates (Not reported). The superscript *,** and *** indicates statistical significance at the 1%, 5% and 10% level, respectively. Obs means the number of countries that have all institutional variables. Adj-R^2 is the value of Adjusted-R^2 for the regression.

7.3. Robustness check

The results using annual avarerage method are presented in Tables 7.10 and 7.11 respectively. The signs are almost similar as in Tables 7.6 and 7.7, except for the findings that legal origin show significant and positive relatioship to leverage and a marginal positive relationship between credit information index and subsidies, thereby, reinforcing the findings in Tables 7.6 and 7.7. All other variables are not significant but signs of the coefficients are in the same direction with ealier findings. However, with limited data, it is expected that this method would have less ability to explain MFIs capital structure. It offers limited understanding of the determinants of MFIs capital structure compared to previous method with full data. Thus, in conclusion, the results from the main weighted least squares regression method in Tables 7.6 and 7.7 are upheld.

Table 7.10**:** Direct impact of institutional variables on MFIs leverage using annual average data

Dependent variable	Explanatory variables									Adj-R^2	Obs
	Intercept	CREDRIGHT	CREDINFO	LEGAL	FINDEV	CORRUP	POLSTA	REGUL	GDP		
COUNTRYDUM LEV	-0.329	-0.015	-0.011	0.724***	-0.152	0.048	-0.030	0.028	-1.624	0.80	30
	(-1.09)	(-1.34)	(-0.63)	(4.26)	(-0.85)	(0.76)	(-0.67)	(0.44)	(-1.32)		
	-0.575**	-0.012	-0.014	0.802***	-0.055	0.045	-0.050	0.020		0.79	30
	(-2.38)	(-1.08)	(-0.78)	(4.94)	(-0.33)	(0.71)	(-1.15)	(0.30)			
	-0.353	-0.015	-0.009	0.750***	-0.136	0.039	-0.037		-1.570	0.81	30
	(-1.22)	(-1.40)	(-0.55)	(4.84)	(-0.79)	(0.67)	(-0.88)		(-1.31)		
	-0.207	-0.014	-0.012	0.656***	-0.179	0.041		0.043	-1.897	0.80	30
	(-0.88)	(-1.33)	(-0.72)	(4.87)	(-1.04)	(0.67)		(0.71)	(-1.66)		
	-0.425**	-0.010	-0.017	0.701***	-0.076	0.032		0.044		0.79	30
	(-2.08)	(-0.93)	(-0.99)	(5.09)	(-0.45)	(0.51)		(0.70)			
	-0.586**	-0.012	-0.012	0.819***	-0.046	0.039	-0.054			0.80	30
	(-2.52)	(-1.13)	(-0.75)	(5.51)	(-0.29)	(0.66)	(-1.35)				
	-0.204	-0.015	-0.010	0.677***	-0.162	0.024			-1.906	0.81	30
	(-0.88)	(-1.38)	(-0.59)	(5.21)	(-0.96)	(0.43)			(-1.69)		
	-0.423**	-0.010	-0.014	0.722***	-0.057	0.015				0.79	30
	(-2.09)	(-0.97)	(-0.86)	(5.45)	(-0.35)	(0.25)					

This table presents the WLS regression results of country dummy coeffcients (α_j) against institutional-specific factors and estimated in Equation (5.9): $\alpha_j = \gamma_0 + \gamma_1 CRERIGHT_j + \gamma_2 CREINFO_j + \gamma_3 LEGAL_j + \gamma_4 FINDEV_j + \gamma_5 CORRUP_j + \gamma_1 POLSTA_j + \gamma_1 REGUL_j + \gamma_1 GDP_j + w_j$. All institutional-specific variables are defined in Table 7.2. The weight are the inverse standard errors of the corresponding country dummy coefficients. Regional dummies are included in the estimates (Not reported). The superscript *, ** and *** indicates statistical significance at 1%, 5% and 10% level respectively. Obs is the number of countries that have all instituional variables. Adj-R^2 is the value of adjusted-R^2 for the regression

Table 7.11**:** Direct impact of institutional variables on MFIs subsidies using annual average data

Dependent variable	Explanatory variables									Adj-R^2	Obs
	Intercept	CREDRIGHT	CREDINFO	LEGAL	FINDEV	CORRUP	POLSTA	REGUL	GDP		
COUNTRYDUM SUBS	0.130	-0.009	0.021*	0.059	-0.215	0.034	0.002	0.025	-0.208	0.35	27
	(1.22)	(-1.19)	(2.00)	(1.25)	(-1.54)	(0.80)	(0.07)	(0.52)	(-0.23)		
	0.125	-0.008	0.021*	0.058	-0.204	0.033	0.000	0.024		0.34	27
	(1.24)	(-1.20)	(2.05)	(1.27)	(-1.61)	(0.80)	(0.00)	(0.51)			
	0.154	-0.008	0.022**	0.062	-0.223	0.030	0.000		-0.136	0.33	27
	(1.63)	(-1.17)	(2.12)	(1.34)	(-1.64)	(0.73)	(0.00)		(-0.15)		
	0.130	-0.009	0.021*	0.058	-0.214	0.036		0.025	-0.190	0.35	27
	(1.26)	(-1.22)	(2.07)	(1.47)	(-1.59)	(0.93)		(0.53)	(-0.22)		
	0.125	-0.008	0.021**	0.058	-0.204	0.033		0.024		0.34	27
	(1.27)	(-1.23)	(2.11)	(1.52)	(-1.65)	(0.93)		(0.52)			
	0.149	-0.008	0.021**	0.061	-0.215*	0.029	-0.001			0.33	27
	(1.72)	(-1.20)	(2.18)	(1.37)	(-1.76)	(0.74)	(-0.04)				
	0.154	-0.008	0.022**	0.062	-0.223	0.030			-0.136	0.33	27
	(1.68)	(-1.21)	(2.19)	(1.63)	(-1.71)	(0.84)			(-0.16)		
	0.149*	-0.008	0.021**	0.062	-0.215*	0.029				0.33	27
	(1.76)	(-1.23)	(2.25)	(1.68)	(-1.81)	(0.85)					

This table presents the WLS regression results of country dummy coeffcients (α_j) against institutional-specific factors estimated in Equation (5.9): $\alpha_j = \gamma_0 + \gamma_1 CRERIGHT_j + \gamma_2 CREINFO_j + \gamma_3 LEGAL_j + \gamma_4 FINDEV_j + \gamma_5 CORRUP_j + \gamma_1 POLSTA_j + \gamma_1 REGUL_j + \gamma_1 GDP_j + w_j$. All institutional-specific variables are defined in Table 7.2. The weight are the inverse standard errors of the corresponding country dummy coefficients. Regional dummies are included in the estimates (Not reported). The superscript *, ** and *** indicates statistical significance at 1%, 5% and 10% level respectively. Obs is the number of countries that have all instituional variables. Adj-R^2 is the value of adjusted-R^2 for the regression.

7.4. Literature Summary

Prior studies finds that a firms capital structure are influenced by firms-specific factors and institutional specific factors. In this study, we investigate the capital structure of MFIs based on some important firm characterisitcs. Studies by Booth et al., (2001), Gianetti, (2003), de jong et al., (2008), Frank and Goyal, (2009) and Fan et al., (2012) report that most cross-sectional variation in international capital structure is caused by heterogeneity of firm-specific determinants. A remarkable feature of these studies on international capital structure is the implicit assumption that the impact of firm-specific determinants on leverage is equal across countries. This seems to be the case in the microfinance studies (Tchuigoua, 2014; 2015). This study utilized an alternative regression framework proposed by de Jong et al., (2008) using microfinance experience to investigate the validity of this implicit assumption.

Similarly, previous studies on firms capital structure demonstrate that the impact of institutional-specific factors on firm capital structure can be grouped in two ways. On the one hand, these factors influence capital structure directly (Rajan and Zingales, 1995; La Porta et al., 1998; Hall et al., 2004; de Jong et al., 2008; Fan et al., 2012; Tchuigoua, 2014). For example, Tchuigoua, (2014) studies a sample of 292 MFIs and shows that strong creditors rights is associated with higher leverage. A more developed bond market facilitating issue and trading of public bonds may lead to the use of higher leverage in a country (de Jong et al., 2008).

On the other hand, some studies show that institutional-specific factors can also influence capital structure indirectly through their impact on the effect of firm-specific factors (de Jong et al., 2008; Gungoraydinoglu and Oztekin, 2011). For example, although the developed bond market of a country stimulates the use of debt, the role of asset tangibility as collateral in borrowing will be rather limited for firms in the same country. In other words, institutional characterisitcs may explain why in one country a firms tangibility affects leverage, but not in

another country. The effect of the firm-specific factors are either strenghtened or mitigated by the institutional specific factors, and these indirect effects of institutional factors may explain the variation in firm capital structure. Previous microfinance studies have not systematically investigated this effect.

7.5. Contribution of the study

This study is the first attempt to carry a detailed comparative analysis of the impact of firm-specific determinants on MFI capital structure across 56 countries. The chapter finds that the impact of several firm-specific factors such as risk, profitability, liquidity, size and age on both capital structure measures (leverage and subsidies) is strong and consistent with standard capital structure theories across a large number of countries. This study therefore, contributes by demonstrating how conventional theories of capital structure, developed using non-MFI firms in developed countries, work well for MFIs in developing countries. As an additional contribution, this study finds that the impact of firm-specific factors on MFI capital structure decision is not equal across countries. This study shows the invalidity of the implicit assumption that the impact of firm-specific coefficients is equal across countries using the microfinance experience.

Other contributions include; first, the study shows that institutional-specific factors determine MFIs' capital structure directly and indirectly. This is a novel approach in the microfinance literature. Second, applying the information asymmetry theory, the study shows the presence of adverse selection in the credit market towards MFIs. In this respect, Higher credit information reflects the non-fully commercial nature of MFIs and the riskiness of the microfinance business. Similarly, the study observes that commercially related institutional-specific factors such as creditors right are not applicable in the case of MFIs non-commercial funding such as subsidies. Finally, the study provides the evidence that institutional-specific

factors indirectly impacts MFIs capital structure by showing how institutional environment mitigates the effect of firm specific factors in determining MFI capital structure decision.

7.6. Summary

The study examines the impact of firm-specific and institutional-specifics factors on MFI capital structure decision across 56 countries. The study investigates the validity of the implicit assumption that the impact of firm-specific factors on MFI capital structure are equal across countries. Furthermore, the study examines the direct and indirect impact of the institutional-specific factors on MFI capital structure decision. Overall, the results show that the implicit assumption is unfounded and the impact of firm-specific factors does differ across countries. Similarly, findings suggest that institutional-specific factors play an important role in determining MFIs capital structure decision around the world.

Chapter 8 - Results III: Joint determinants of the use of deposits and borrowings

8.0. Introduction

The previous chapter examines the determinants of the use of deposits and borrowings saperately. However, it seems unlikely that MFIs consider these two financing instrument independently. In many situations, the decision to use deposits or borrowings depends on the institutional environment in which MFIs operate. This chapter considers the choice between the two instruments and its relationship with the institutional settings.

Gujarati (2003) argues that, in many economic situations, it is not uncommon for the dependent and independent variables to be determined simultaneously, rendering a one-way or unidirectional cause-and-effect relationship less meaningful. Moreover, Baltagi (2005) suggest that many economic relationships are dynamic in nature in which the dynamic relationships are characterised by the presence of a lagged dependent variable among the repressors. In light of these two arguments, this chapter presents the results of the joint determinants of the use of deposits and borrowings based on the dynamic panel data method. By examining deposits and borrowing simultaneously, the behaviour of the determinants in influencing the decisions can be better ascertained and also the extent to which borrowing and deposits are substitutes or complement are re-investigated.

In terms of the sampling, a similar sample of firms as used in Chapter 7 is employed (i.e., final sample of 645 MFIs or 5215 firm year observations). The chapter proceeds as follows: Section 8.1 briefly presents the descriptive statistics of key variables. Section 8.2 discusses results of the dynamic panel data method. Section 8.3 extends the analysis on the sensitivity of the substitutability relationship. Contribution of the study are presented in Section 8.4. Section 8.5 summarises the chapter.

8.1. Descriptive statistics

Since this chapter employs similar set of explanatory variables as used in Chapter 7, the results and the subsequent discussion of the descriptive statistics of this chapter are limited to the two dependent variables namely, deposits and borrowing ratio. These statistics are presented in Table 8.1 below. Comparing with prior deposits and borrowing ratios used in Chapter 6 (i.e., Table 6.2), notice that the downward adjustement of the mean and median values is expected as the study period is longer in this chapter compared to Chapter 6.

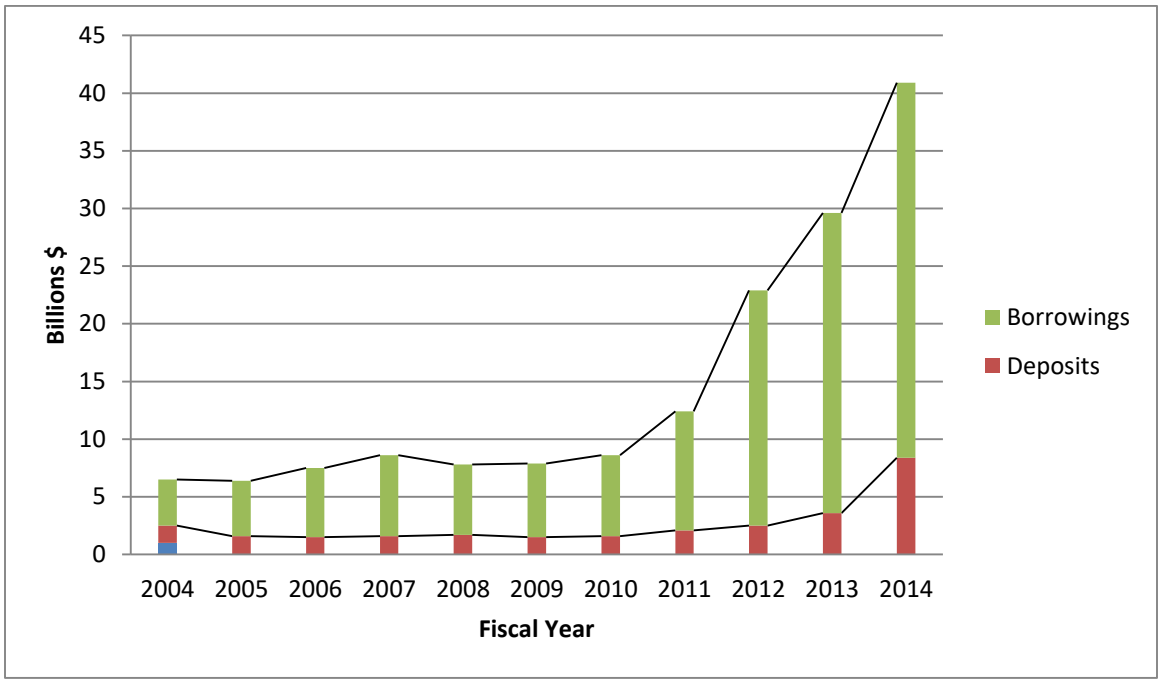
Table 8.1
Summary statistics

Panel A: Overall sample description

Variables	Mean	Median	Standard deviation	Minimum	Maximum	Obs
Dependent variables						
Deposits (DEP)	0.179	0.000	0.268	0.000	2.543	4666
Borrowings (BORR)	0.439	0.466	0.288	0.000	4.985	4946
Institutional variables						
Creditors right (CREDRIGHT)	5.064	5.000	2.526	0.000	11.000	4859
Credit Information (CREDINFO)	3.739	5.000	2.553	0.000	8.000	4859
Financial sector development (FINDEV)	0.342	0.317	0.153	0.021	1.060	5198
Legal origin (LEGAL)	0.280	0.000	0.449	0.000	1.000	5221
Corruption (CORRUP)	-0.623	-0.620	0.389	-1.640	1.560	5221
Political stability (POLSTA)	-0.792	-0.740	0.679	-2.810	1.160	5198
Regulations (REGUL)	0.657	1.000	0.475	0.000	1.000	5177
Economic Growth (GDP)	0.038	0.036	0.038	-0.139	0.330	5220

The sample consists of 645 MFIs during the period 2004-2014 (6500 firm year observations).

Figure 8.1. Total deposits and borrowings, 2004-2014



Source: Mix Market, 2004-2014. See data in Funding Structure Analysis

Figure 8.1 illustrates the total deposits and borrowings financing to MFIs between the 2004 and 2014[7]. Borrowings constitutes the major source of funding to MFIs. Borrowings increased from 10 billion USD in 2011 to 34 billion USD in 2014. Similarly, deposits increase from 2 billion USD to 8 billion USD in 2014.

8.2. Dynamic panel data results

Going further, the results of the dynamic panel data are reported in Table 8.2 overleaf. The Sargan test statistics do not reject the joint null hypothesis that the model is correctly specified and that the instruments used in the estimation are valid. The estimates also test negatively for second-order correlation, and satisfy this necessary condition for the consistency of the GMM estimator (Arellano and Bond, 1991). Of primary interest to this chapter, it seeks to examine whether the joint specification alter the results of saperately investigating the determinants of the use of deposits and borrowings by many microfinance literatures. Regarding the country's credit right, it

[7] The information contain in the graph is for MFIs that only report to Mix Market, and does not represent the entire MFIs around the world.

is found that the joint specification analysis has improved the results. There is a no clear distiction between the effect of creditors right on deposits and borrowing, where the coefficient is positively related with both deposits and borrowings, but only significant in deposit specification. This suggest that the strenght of creditors right is relevant in MFIs decision to mobilize deposits. This contradicts the findings of Tchuigoua (2014) on negative relationship between creditors right and deposits. By contrast, there is clear distinction between the creditors information effect on deposits and borrowings, where the coefficients is positively (negatively) related with deposits (borrowings), but only significant in borrowing specification. This suggest that the presence of better creditors information sharing is only relevant when MFIs make decisions to borrow (non-deposits laibilities). The result is consistent with the findings of Chapter 7, where we show the presence of adverse selection in the credit market towards MFIs.

The results also improve our understanding on the relationship between financial sector development and the decision for MFIs to borrow and mobilize deposits. The results shows that the relationship is positively significant with borrowing, while the sign of the coefficient is positive in the deposit specification. This suggest that a developed financial sector is important to MFIs when making decision to borrow consistent with previous MFIs studies by Tchuigoua, (2014) that find complimentarity between formal banking sector and microfinance sector. Perhaps, MFIs in countries with well developed financial sector face less information asymmetry problem and consequently increases MFI access to debt. The higly significant negative relationship between corruption variable and deposits is contrary to the findings in previous microfinance studies (Tchuigoua, 2014). Generally, this result suggest that MFIs find it difficult to raise deposits financing in an environment with high level of corruption.

Table 8.2
Dynamic panel data estimates

	Exp sign	(1) DEP	(2) BORR
lagged DEP	?	0.692***	
		(12.54)	
lagged BORR	?		0.237***
			(6.24)
BORR	?	-0.069***	
		(-4.89)	
DEP	?		-0.586***
			(-7.54)
CREDRIGHT	+	0.002***	0.004
		(2.83)	(1.54)
CREDINFO	+	0.001	-0.005***
		(1.39)	(-2.66)
FINDEV	+	0.026	0.216***
		(1.43)	(4.80)
LEGAL	+	0.067	-0.248
		(0.81)	(-1.00)
CORRUP	-	-0.019**	0.024
		(-2.02)	(1.20)
POLSTA	+	0.001	0.014
		(0.28)	(1.23)
REGUL	+	0.298***	-0.198
		(3.59)	(-1.08)
GDP	+	0.026	0.087
		(0.84)	(1.37)
CONSTANT		-0.161***	0.574***
		(-2.68)	(5.39)
OBS		3795	3994
Sargan x^2		64.02	60.74
AR (1)		-3.86***	-4.79***
AR (2)		-0.37	-0.43

The sample consist of 3795 firm year observation for deposits estimates and 3994 firm year observation for borrowings estimates over the period of 2004 to 2014, but the estimations are over $t = 3,....,T$; where $T = 8$. Borrowing is the ratio of total borrowings (non-deposit liabilities) to the total assets of MFIs. Deposits are the ratio of total deposits to the total assets of MFIs. Creditors right (CREDRIGHT) is the legal rights of borrowers and lenders measured by the index (0 to 10; Doing Business). Credit information (CREDINFO) is the index that measures the scope and accessibility of credit Information available through either a credit bureau or a credit registry (0 to 6; Doing Business). Financial sector development (FINDEV) is the domestic credit to private sector (% of GDP) provided by World Banks. Corruption (CORRUP) is an index that measures the control of corruption provided by world governance indicators (-2.5 to 2.5; WGI). Political stability (POLSTA) is an index that measures political stability and absence of violence/terrorism (-2.5 to 2.5; WGI). Economic growth (GDP) is the annual growth rate of the GDP per capita of a country (World Bank). Year dummies for 2006 to 2013 are included in the estimates (not reported). Single expected sign is applicable to both borrowing and

deposits; otherwise the dual signs apply particularly to borrowings (deposits). z-statistics in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).

Prior evidence of a positive influence of prudential regulation on deposits financing is also confirmed by the joint specification estimates. Because of the importance of protecting public depositors fund, strict regulations are in place to ensure soundness of institutions allowed to mobilize deposits, which invariably reduces depositors risk. To some extent, the results have confirm the findings on the role of prudential regualtions on borrowings. While the results show a negative sign of the coefficient but not significant.

Turning to the question of whether deposits and borrowing are complements or substitute, the results clearly show that the sign of the coefficients (i.e., BORR in DEP specification and vice-versa) are consistently negative in both specifications and significant. To this end, this evidence of substitutability tends to answer the question whether deposits and borrowings are substitute or complement. In another, the singinificant positive relationship between the dependent and lagged dependent variables should not be surprising as MFIs do enagage in a persistent pro-cyclical capital structure policy, hence the notion that firms adjust their capital structure infrequently as discussed in Welch (2004) and Strebulaev (2007) is supported.

8.3. Sensitivity of substitutability

In this section, the study investigate the variation in the substitutability between deposits and borrowings in different institutional environment. The three institutional characterisitcs examined are creditors right (column 1), credit information (column 2) and financial sector development

(column 3). Similar to the two-step GMM technique used, Table 8.3 reports the results on the change in total deposits[8].

In columm 1, it is found that the coefficient of the intereactive variable, *BORR*CREDRIGHT*, is not significant. This suggest that the substitutability between deposits and borrowings is indifferent on whether the strenght of creditors right is either strong or weak. In column 2, the coefficient of the intereactive variable, *BORR*CREDINFO* is not significant as well. This result suggest that the substitutality relationship between deposits and borrowings is less pronounced in environments with strong or weak credit information, hence rejecting the asymmetric information hypothesis.

Finally, turning to the effect of financial sector development on the substitutability between deposits and borrowings. Financial sector development is used as a proxy of information asymmetry. As suggested by Diamond (1984) and Gianetti (2003) that the developed financial sector overcomes information asymmetry and facilitate external financing to firms. Tchuigoua (2014), came to similar conclusion using microfinance data. Interestingly, it is found in column 3 that the coefficient of the interactive variable *BORR*FINDEV* is significant and negative. This suggest that the substitutability between deposits and borrowing is more pronounced in a developed financial sector, hence supportng the asymmetric information hypothesis. MFIs tend to substitute borrowing against deposits in a developed financial sector. That is, an extra amount of borrowings decreases the amount of deposits of MFIs to a greater degree in a well developed financial sector.

[8] Replacing the change in the total deposits ratio with the change in the borrowings ratio will yield results similar to those presented in the study.

Table 8.3

Sensitivity of the substitutability relationship between deposits and borrowing

		DEP		
	Exp sign	(1)	(2)	(3)
lagged DEP	?	0.693***	0.692***	0.682***
		(12.61)	(12.56)	(12.21)
BORR	?	-0.068***	-0.069***	-0.115***
		(-2.98)	(-3.78)	(-4.74)
*BORR*CREDRIGHT*	?	0.000		
		(0.00)		
*BORR*CREDINFO*	?		0.000	
			(0.06)	
*BORR*FINDEV*	?			-0.127**
				(-2.51)
CREDRIGHT	+	0.002	0.002***	0.002***
		(1.09)	(2.84)	(2.94)
CREDINFO	+	0.001	0.001	0.001
		(1.35)	(0.72)	(1.51)
FINDEV	+	0.026	0.026	-0.033
		(1.47)	(1.40)	(-1.13)
LEGAL	+	0.068	0.068	0.062
		(0.82)	(0.82)	(0.74)
CORRUP	-	-0.019**	-0.019**	-0.017*
		(-2.06)	(-2.00)	(-1.71)
POLSTA	+	0.001	0.001	0.003
		(0.27)	(0.27)	(0.63)
REGUL	+	0.298***	0.299***	0.308***
		(3.62)	(3.60)	(3.66)
GDP	+	0.026	0.026	0.030
		(0.85)	(0.84)	(0.93)
CONSTANT		-0.162***	-0.162***	-0.142**
		(-2.69)	(-2.69)	(-2.29)
OBS		3795	3795	3795
Sargan x^2		64.23	64.03	63.20
AR (1)		-3.86***	-3.86***	-3.84***
AR (2)		-0.37	-0.38	-0.40

Notes: see Table 8.2

Financial sector development can serve as a proxy for information asymmetry between MFIs and the credit market. MFIs in operating in a developed financial sector with lower asymmetric information are more likely to access long-term funding such as borrowings. Thus, the result in this chapter is consistent with the asymmetric information hypothesis, suggesting that the substitutability between deposits and borrowings is more pronounced in credit market that face a greater degree of asymmetric information.

8.4. Contribution of the study

This chapter contributes to the substitutability literature by introducing the substitutability of deposits-borrowings in the microfinance context. To our knowledge, empirical investigation along the substitutability of deposits and borrowings of MFIs is currently non-existent. The study contributes by presenting fresh empirical evidence and renewed interpretation regarding the relationship between MFIs access to deposits and borrowings. The study show that the degree of substitutability between deposits and borrowing is more pronounced in a developed financial sector, where the degree of information asymmetry is lower. In this regard, this study highlights the importance of institutional environment as an indicator for possible determinants of substitutability of MFI financial assets.

8.5. Summary

This chapter has presented an empirical examination on the relation between deposits and borrowings. A model was constructed to relate the substitutability or complementarity of deposits and borrowing simultaneously, rather than sapereately as in Chapter 6. The study then test the hypothesis of deposits-borrowing substitutability using the GMM technique that controls for both endogeneity issues and MFI fixed effects. The result shows strong evidence that deposits and borrowings are substitutes rather than complement. Essentially, this chapter highlights useful

insight to enrich our understanding of the interactions among alternative financing choices in an environment associated with asymmetric infromation problems.

Chapter 9 - Summary and conclusions

9.0. Introduction

This chapter presents the key conclusion of this study, their implications, and the areas for future research. The conclusions are presented in four sections with reference to the main research objectives. The first section (9.1) presents the effect of board gender diversity on microfinance institutions capital structure. The impact of firm-specific and institutional-specific factors on microfinance institutions capital structure are presented in the second section 9.2. The third section (9.3) is about the joint determinants of microfinance institutions capital structure variables of deposits and borrowings. The fourth section (9.4) is about the applicability and limitations of the findings from previous studies to the microfinance institutions. The four conclusion sections are followed by: the implications of the conclusion made (9.5); a summary of key contributions to knowledge made by this study (9.6); and finally, the areas for future studies 9.7.

9.1. The effect of board gender diversity on MFIs capital structure

Based on the empirical evidence from the econometric analysis provided in Chapter 6, we conclude that board gender diversity affects microfinance institutions capital structure variables such as leverage, deposits and subsidies. The p-values of these variables were significant at 5 percent level of significance. Additionally, considering different instrumental variable procedure and various female director definition, we find empirical evidence that female directors have significant positive influence on deposits and subsidies, supporting the resource dependency argument respectively. Furthermore, we show evidence that when a critical mass of three or more female directors is reached, MFIs tend to leverage more.

9.2. The impact of firm-specific and institutional-specific factors on MFIs capital structure

The econometric results provided in Chapter 7 presents the empirical results of the investigation on the impact of firm-specific and institutional-specific determinants of capital structure. First, the study makes a detailed comparative analysis of the impact of firm-specific determinants on MFI capital structure across 56 countries. Considering the two capital structure measures (leverage and subsidies), we conclude that the impact of firm-specific factors such as risk, profitability, liquidity and size on leverage is strong and consistent with standard capital structure theories across a large number of countries. However, determinants such as tangibility and age show unexpected signs. Considering the impact of firm-specific factors on subsidies, the study finds that the impact of tangibility and size on subsidies are consistent with our predictions. However, results from a few determinants remain mixed, and in some countries, some coefficients are significant with an unexpected sign. Secondly, using a simple statistical test known as joint test of significance of regression coefficients, the study concludes that the implicit assumption on the equal impact of firm-specific factors on MFI capital structure across countries is unfounded.

In the analysis of the direct and indirect impact of Institutional-specific factors on MFIs capital structure. The study observes that institutional-specific factors such as credit information index, legal origin, political stability and regulations significantly explain the variation of MFIs leverage across countries. Factors such as financial sector development, corruption, regulation and economic growth significantly determine the level of MFIs subsidies across countries. In the indirect impact of institutional factors, the result shows the importance of institutional factors as we report their significance effect through firm-specific factors. For example, the presence of good credit information sharing encourages MFIs to borrow more despite the availability of internal finance, that is, the effect of firm-specific determinants such as profitability and liquidity are

mitigated. In countries with developed financial sector, MFIs size is less important in determining MFIs choice of subsidies.

9.3. Joint determinants on the use of deposits and borrowings

From the empirical evidence obtained from the econometric results in Chapter 8, we generally conclude that deposits and borrowings are substitute rather than complement. The sensitivity of this result is tested using various institutional-specific variables and we conclude that the degree of substitutability is more pronounced in financially developed market, where information asymmetry is expected to be lower. The p-value of the coefficient of this variable is statistically significant at 5 percent significant level.

9.4. Implications of the conclusions made

The conclusions made in this chapter imply that, to have access to funding, microfinance institutions should have more female directors on their boards. First, female directors attract more subsidies to MFI because donor agencies consider microfinance institutions as part of the social investment field. From a pragmatic point of view this seems reasonable. After all, even if a donor agency does not specifically focus on female board representation as an indicator of social performance, normally half of MFIs customers will in any case be women (D'Espallier et al., 2011). As a result, donor agencies should concentrate in identifying MFIs that can demonstrate good level of social performance combined with sound financial results and efficient operations.

Second, MFIs should utilise the easy access to deposits brought about by the matching trait between female directors and female customers. That is, having more female board representation brings about more savings from female customers. This may promote financial sustainability as well as social performance. Third, MFIs access to risky capital comes only when they have three

or more female directors on board. This evidence however, should be treated with caution, considering the impact of increasing female directors on firm governance quality and subsequent agency problems. On one hand, Adams and Ferreira (2009) show that in a well governed firms, more female directors may be detrimental to firm value due to unnecessary over-monitoring. On the other hand, Gull et al., (2011) and Strom et al., (2011) suggest that firms can partially remedy their weak governance by having more female directors. Therefore, the debate around increased female board representation should offer a more cautious route towards encouraging MFIs to strike balance between bringing more female directors to their board rooms and its implication on agency problem.

Fourth, the conclusion made on how standard firm-specific determinants affects the MFIs capital structure on a country-by-country basis imply the following for microfinance institutions. For access to leverage, MFIs should strive to keep lower their tangibility ratio, less portfolio at risk, improve profitability, maintain higher liquidity to meet short-term obligations as they fall due and be large in size to absorb any shock. In the case of subsidies, MFIs are expected to maintain higher level of tangibility, liquidity and be matured and small in size to have access to subsidies. Overall, the conclusion implies that proper combination of firm-specific determinants that are unique for each country is necessary. This is because, in each country, one or more firm-specific determinants are not significantly related to leverage and subsidies. Moreover, the econometric results (an evidence) show that the equal impact of firm-specific determinants across countries is not true.

Fifth, evidence provided in our econometric results highlights the importance of the impact of institutional-specific factors in determining MFI capital structure decision around the world. As implied in the findings and conclusion there from, institutional-specific factors directly and indirectly affect capital structure of MFIs. Thus, institutional factors need to be appropriately taken

into account in the analysis of MFI capital structure. Sixth, the microfinance institutions should understand the effect of institutional factor such as credit information bureau on MFI capital structure choice. For example, MFIs in countries with good credit registry experience lower leverage, while the same would increase subsidies. That is, credit information reveals the non-fully commercial nature of MFIs and riskiness of microfinance business, hence, MFI choice of less leverage and more subsidies. This could risk the sustainability of MFIs as donor funding weans. MFIs need to show its business worthiness by attracting commercial funding and at the same maintain its social orientation to attract non-commercial funding.

The impact of institutional factors on MFIs capital structure through its effect on firm-specific factors is highly important. because of the nature of MFIs. They are typically small and mostly operate in rural areas which makes it difficult to determine their clear predictors of success. Therefore, institutional factors serve as either mitigating or reinforcing factors on MFIs level characteristics. Additionally, the choice between deposits and borrowings under different institutional environment, implies the need for MFIs to be flexible in maintaining optimal capital structure that may eventually lead to sustainability. Although we did not investigate the link between capital structure and sustainability, ensuring that MFIs have optimal capital structure becomes imperative if MFIs have to remain sustainable.

From a practical point of view, the empirical evidence of this study may provide useful guidance for policy makers, regulators and corporate decision makers. Ultimately, the case for greater gender diversity on corporate board rest on pure economics rather than sense of fairness. Our result does point to greater influence of female directors on MFI capital structure. We therefore, consider the possibility of regulations around increased gender diversity on MFIs board rooms, consistent with many developed countries (among them, Belgium, Norway and Italy) that have passed

legislation mandating more female board representation for certain firms. The study also highlights that the impact of institutional-specific factors on MFIs capital structure decision is not straightforward because of the non-commercial part of their capital structure. This particular uniqueness of MFIs makes it difficult for them to thrive in an efficient credit market. Evidence suggest the presence of adverse selection issue in the credit market towards MFIs. It is therefore, important for MFIs to develop a good financing strategy to access funding in the credit market. In addition, government and regulatory agencies should consider developing a unique financial package for MFIs, taking into account the peculiar and rampant information asymmetry in the sector. Financial institutions such as Stock Exchange should have a look at their listing requirements and work towards designing a mechanism that would enable MFIs to get listed in order to access funding.

9.5. Contribution to Knowledge made by this study

The key contributions to knowledge made by this study are: First, this is the first attempt to determine the factors affecting microfinance institutions capital structure around the world. Applying the capital structure theories, the study has determined both firm-specific and institutional-specific factors that affects the capital structure decision of microfinance institutions. Second, the study reveals the relationship between board gender diversity and MFIs capital structure is driven by reverse causality. However, when this relationship is not considered in determining factors affecting MFI capital structure, there may be inconsistent evidence on the role of female directors. Third, it unveils the trade-off between improving and worsening governance quality by having more female directors on board. That is, more female directors on board, improves governance quality which reduces agency problem and increases firm leverage undertaking. On the other hand, more female directors on board is associated with excessive over-

monitoring that worsens governance quality which leads to less gearing. Fourth, the study provides empirical evidence that the impact of female directors on microfinance institutions risk-taking depends on the number of them in board. Lastly, consistent with the resource dependence view, the study provides empirical evidence that female directors on boards improves their access to subsidies.

Other contributions to knowledge include: First the study documents the applicability of standard firm-specific determinants of capital structure to microfinance institutions. Second, applying the theories of capital structure, studies using firms in developed countries, work well for MFIs in developing countries. As an additional contribution, this study finds that the impact of firm-specific factors on MFI capital structure decision is not equal across countries. This study shows the invalidity of the implicit assumption that firm-specific coefficients are equal across countries using the microfinance experience. Second, the study shows that institutional-specific factors determine MFIs' capital structure directly and indirectly. This is a novel approach in the microfinance literature. Third, applying the information asymmetry theory, the study shows the presence of adverse selection in the credit market towards MFIs. In this respect, Higher credit information reflects the non-fully commercial nature of MFIs and the riskiness of the microfinance business. Similarly, the study observes that commercially related institutional-specific factors such as creditors right does not affect MFIs non-commercial funding such as subsidies. Additionally, the study provides the evidence that institutional-specific factors indirectly impacts MFIs capital structure by showing its mitigating and reinforcing influence on various firm-specific factors.

Similarly, the study contributes by presenting fresh empirical evidence and renewed interpretation regarding the relationship between MFIs access to deposits and borrowings. To our knowledge, empirical investigation along the substitutability of deposits and borrowings of MFIs is currently

non-existent. The study confirms that deposits and borrowings are substitute and that the degree of substitutability is more pronounced in a developed financial sector, where the degree of information asymmetry is lower. In this regard, this study highlights the importance of institutional environment as an indicator for possible determinants of substitutability of MFI financial assets. Finally, the study provides evidence that decomposing MFIs capital structure helps to better explain its determinants.

9.6. Limitations of the study and areas for future research

In this study, we attempt to determine factors affecting capital structure of microfinance institutions. The research design, therefore, was specifically focused to address this microfinance institutions problem. Thus, the findings in this study are subject to a number of limitations that deserve further works and research. First, the study reveals that female directors affects MFIs capital structure. Future research would benefit by exploring other female leadership role such as female CEO, female chair and CEO duality. The effect of female directors on MFI capital structure can be strengthened by examining complementary female director characteristics such as occupational background, education, experience and skills. In addition, supplementing the empirical investigation with a qualitative study (for example, using interview data as in Konrad et al., (2008) can increase the reliability of the findings. Perhaps future research can focus more on testing the psychological influence in female decision making by incorporating cognitive biases and limitations into financing decision models.

Second, this study used five years' data to determine the effect of board gender diversity on MFIs capital structure. The study is limited to five years because female director information is unavailable beyond this period. Thus, the five years' period is too short to allow some detailed econometric analysis. For example, we were not able to perform other test at two or more lags due

to fewer observations that we had. More observations, given longer study period would have helped to isolate time effects on capital structure even before explaining the determinants of MFI capital structure. Thus, future studies may consider taking longer study period. The longer study period may unearth what was probably not unveiled in this study.

Fifth, in this study we attempted to control for the effect of geographical location on MFIs capital structure. Although the results were insignificant, the implied differences in institutional environment may call for future research. For instance, Galema et al., (2011) and CGAP (2011) highlight that debt as the main funding instrument in which MFIs in Europe and central Asia as well as those in Latin America and Caribbean can easily access while deposits are the main source of funding for MFIs in Africa. This may be partly explained by the quality of the institutions in these regions. Therefore, investigating whether the quality of institutions is the main driver of MFI capital structure in those regions is a subject for further research.

Sixth, in this study, we attempt to explain the impact of institutional-specific factors on MFIs non-commercial source of funding such as subsidies. However, we did not find any significant results because they are in many cases not legal binding. Therefore, other unobserved institutional factors may determine MFIs access to non-commercial funding. For instance, broad base financial inclusion is an important determinant for donor agencies (Earne and Sherk, 2013). It thus seems important to extend this study in examining other unobserved institutional specific factors.

Lastly, in this study we use different capital structure measures (leverage, borrowings, deposits, equity and subsidies). However, as we noted above, the results may be biased as microfinance institutions access other sources of funding other than the ones studied. For example, donations for operating and non-operating expenses are recorded in the income statement and excluded from

subsidies (Hudon and Traca, 2011). Thus, future studies may focus on, among others, to explain the exact composition of microfinance capital structure. This will help to apply appropriate measures of MFIs capital structure studies.

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